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JOSEPH COATS, M.D.,

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JOHN LINDSAY STEVEN, M.D.,

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ORIGINAL ARTICLES.

THE CAUSES OF THE NEGLECT OF SUPPURATIVE EAR-DISEASE.[1]

BY JAMES ERSKINE, M.A., M.B.

DISEASES of the ear have been neglected more than affections of any other organ of the body. That circumstance arises from a variety of causes more or less directly related to the situation and structure of the organ of hearing, as also to the characteristic features of the diseases affecting it, and the aspect in which they have been regarded by the general public and the medical profession.

In considering the subject of suppurative disease of the ear, the prominent outer ear or auricle may be almost entirely disregarded, along with the external auditory meatus or canal extending inwards for a distance of about an inch. The auricle and external passage together form the outer ear, as distinguished from the middle and inner ear. The part of the organ with which we are mainly concerned is *the middle ear*, which is also known by the names of tympanum, tympanic cavity or tympanic chamber, ear-drum or drum-cavity, these terms being employed quite synonymously. The membrana

[1] An Address, delivered 1st May, 1895, introductory to Course on Aural Surgery at Anderson's College, Glasgow.

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tympani or tympanic membrane, drum-head or drum-membrane, forms the partition wall between the middle and external ear. That diminutive membrane, measuring only a quarter of an inch in diameter, is often erroneously termed the "drum of the ear." It is the structure of the middle ear most subject to disease, and to partial or total destruction, usually described as a perforation or hole in the drum, or, as it should be correctly stated, in the drum-head, because it only forms the outer wall of the drum-cavity.

The middle ear is a small air chamber, about half an inch in height and width, and from a twelfth to a sixth of an inch deep, measured from the drum-head inwards. It is lined with a most sensitive mucous membrane, which also covers the drum-head on its inner surface. The mucous covering is continuous with that of the back of the throat and nose through a minute passage, the Eustachian tube, extending directly from the front wall of the drum for a distance of about an inch and a half. It is thus evident that the drum-cavity may be approached from the upper and back part of the nose and throat. From that quarter disease most commonly invades the ear, for affections of these situations are the usual causes of inflammation of that organ. The three small bones, or ossicles, named from their shape, the malleus or hammer, the incus or anvil, and the stapes or stirrup form a bridge across the middle ear, the one end of the arch being fixed in the drum-head, and the other in a small oval opening or window in the inner wall of the cavity, which communicates with the delicate contents of the internal ear or labyrinth. Behind and below the oval opening is another, round in shape, and closed by a membranous structure, called the internal or secondary tympanic membrane. The inner wall of the tympanic cavity is composed of hard bone. A ridge may be observed in the dried bone behind the oval opening, which is formed by the course of a small canal conveying the nerve which controls the muscles of the face.

The extension of acute and chronic affections of the drum of the ear to the facial nerve may produce paralysis of the corresponding side of the face. The implication of that nerve by disease of the middle ear may indirectly affect the eyesight, the patient being unable to close the eye, which, therefore, suffers from exposure. By extension of disease to a branch of the facial nerve, the chorda tympani, passing through the drum-cavity, the sense of taste may be also impaired. Smell may be affected, owing to the inability of the patient to dilate the nostrils. Even the development of the structures of one

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side of the face may be arrested, and permanent disfigurement result, if extensive affection of the ear occur in young children.

The roof, or upper part of the tympanic cavity, consists of a very thin plate of bone, which forms the partition separating it from the interior of the skull containing the brain. Disease often extends from the ear in the direction of the cranial cavity, and sets up very serious, if not fatal, disease of the brain and its coverings.

There is a small communication opening on the back wall of the drum-cavity, and leading to the bone behind the ear, termed the mastoid process of the temporal bone. Inflammatory affections extend from the ear to the cell-spaces in that bone, and excite destructive and wide-spreading disease. In some cases the purulent accumulation bursts through the skin over the bone behind the ear, and establishes a permanent suppurating channel.

Under the floor of the tympanic chamber runs the jugular vein on its way to the lower part of the neck. Ear disease implicating that large blood-vessel is often attended with disastrous consequences.

In front of the drum-cavity, and separated from it only by a thin layer of bone, is situated another large vessel, the carotid artery, which may be affected by disease or injury involving the ear.

Extension of middle ear disease may also take place through the inner wall of the cavity directly to the internal ear, and affect the structures of the labyrinth, resulting in total deafness, giddiness, or brain disease.

Distant parts of the body may be affected by the disease in the cavity of the drum, such as the lungs, and even the bowels, the infection being carried from one organ to the other by the circulation of the blood stream.

The tympanic cavity, situated deeply in the bone of the skull, may be affected with chronic disease while the patient is quite unaware of its serious and dangerous nature. He may not consider it worth while mentioning to relatives or friends. Even his medical adviser is not informed of it in the course of attendance for various illnesses.

Chronic suppurative disease of the ear continuing so long, people affected become quite accustomed to the slight discharge of purulent matter. They acquire the objectionable habit of removing the pus with the handkerchief, and think little of it. Indeed, those who come into close contact with them are often the first to express some sense of annoyance. In many cases the odour from the diseased ear is so offensive that

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although the patient tolerates it, his neighbours will evade him as much as possible. While the fœtid odour of the discharge is a decided indication of the ear affection invading the bone, the matter may be only slightly, or not at all offensive, and yet the disease may be very serious. A person, therefore, suffering from otorrhœa, or a running ear, cannot console himself that his case is not dangerous because the matter is odourless. A discharge from the ear is always an indication of serious and advancing disease.

Patients affected with suppurative affection of the organ of hearing are inclined to postpone treatment more than any other class of sufferers. There is, of course, a natural tendency to put off the necessity of seeking medical advice as long as possible in all cases. The probable inconvenience and fear of pain that may be incurred by medical examination, the anticipated trouble of the necessary attendance for carrying out the treatment, and perhaps also the additional financial consideration, all act more or less in inducing delay in consulting a doctor. In the case of chronic ear disease, moreover, *the absence, as a rule, of pain* keeps the patient from applying for advice. Although middle ear disease is painful in its acute stage, it is seldom troublesome in that respect in its chronic course. Frequently it is the case that the ear has first been acutely affected in infancy, when it has not been observed, or in course of infectious diseases such as scarlet fever, measles, or diphtheria, the affection being masked or obscured at the time by the general or constitutional symptoms. The acute stage of ear disease may occur in these circumstances, and the chronic period sets in thereafter, and continues, as a general rule, without pain.

The ear should always be examined in the early stage of the illnesses of infants and young children, and in all infectious fevers and throat affections; a large proportion of chronic and incurable ear disease would thereby be prevented. Particularly in the case of infants should attention be directed to the ear. Acute inflammatory mischief in the middle ear may produce serious consequences in the case of a baby. It may give rise to great restlessness and fever, with symptoms of affection of the brain. As the child can give no indication of the seat of the trouble, an examination of the ears should always be made at once. Not only in the case of children, but also in adult patients, *acute inflammation of the middle ear is often allowed to run its course* until the purulent accumulation forms, and, having burst through the drum-head, is observed flowing from the outer ear.

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The walls of the drum being composed of bone except at the drum-head, the fluid forming in the course of inflammation soon fills the cavity, and exerts pressure all round, making its way through the membrane, being the place of least resistance. The severe pain suffered in acute middle ear disease arises mostly from the presence of the pent-up fluid on the sensitive mucous covering of the cavity. The pain generally ceases after the drum-head yields, and gives exit to the accumulation of fluid. The patient suffering from acute inflammation of the ear prays that it may burst, and to hasten that consummation he applies heat by various means, such as poultices, fomentations, steam, hot salt, roasted onions, or figs, &c., and endures the agony till the rupture takes place, believing that there is no alternative treatment. In the case of the child the nurse or mother applies similar remedies, and waits for the appearance of matter, and is thankful to see it, as indicating the cause of the child's illness, and at the same time the probable termination of its suffering. Both in the case of the adult and the child a careful inspection of the drum-head would indicate the treatment which would arrest the disease in its earliest stage. If it is ascertained that fluid has already formed in the drum cavity, an almost painless puncture in the tympanic membrane will allow it to escape, and will prevent extension of the inflammation. A minute wound produced in that way will heal perfectly, while a perforation of the membrane occurring in the course of disease takes long to form, and is likely to be permanent.

It is from the point of bursting of the collection of matter through the drum-head that *the commencement of the chronic stage or period of neglect* may be dated. Patients feel so much relieved after the acute suffering that they consider that the inflammation has run its course, and that the rest may be left to nature. In a certain proportion of cases the discharge of matter ceases after a period of weeks or months, and the ear heals without any treatment; but in most cases that fortunate termination does not take place. Gradually the amount of the discharge becomes less, and the patient takes little or no notice of it. But the continuance of the suppuration, although the quantity of the matter is very slight, is fraught with serious consequences. Indeed, those cases are really more dangerous in which the purulent fluid lies in the drum cavity decomposing, setting up irritation, and spreading disease all around, without making any appearance at the outer orifice. In some cases the discharge is only observed at intervals, the patient noticing nothing at other

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times. He is sometimes led, on that account, to infer that the disease has ceased, until he is again reminded of its continuance by the reappearance of the suppuration.

Patients generally allow long periods of time to elapse before seeking advice about aural affections. Years may pass before any treatment is adopted. When such patients consult a doctor, they are strongly inclined to minimise the length of time during which the ears have been affected. They speak rather indefinitely of the duration of the disease, and are slow to admit that it has lasted a long time.

As a rule, patients do not call upon a surgeon owing to the discharge of matter from the ear, but rather on account of some resulting symptom which has appeared for a comparatively short period. For example, *the appearance of blood* flowing from the ear may be observed, and give rise to much alarm. When such patient states his complaint to a surgeon, he will likely only mention the duration of the bleeding, and omit to say that the ear had been affected for months or years previously. Or a patient may complain of *increasing dulness of hearing,* which he has had much occasion to notice within a recent period. Other consequences of chronic suppurative disease may cause a patient to consult a medical practitioner, such as *giddiness, noises in the ear, pain,* or some sense of irritation. The patient does not understand that all these complaints are merely the results of the long-standing disease in the ear. As the suppuration continues, granulations, polypi, and various other growths form, which, being abundantly supplied with delicate blood-vessels, very readily give rise to bleeding from the outer ear. The hearing, as a matter of course, becomes more and more affected by the gradual destruction of the drum-head, and the structures in the drum cavity. The increase of the deafness is very gradual at first, but it finally reaches a stage when it becomes a positive defect and inconvenience to the patient in his social and commercial relations.

Patients suffering from a result of suppurative ear disease, such as deafness, generally make an exclusive complaint of the symptom. It is only when the doctor makes an inspection of the ear that he ascertains the cause of the dulness of hearing or other complaint. He finds the outer ear full of matter, and draws the patient's attention to the fact, who will likely remark—"Oh, it has been running all my life," or "for years," as the case may be. Patients often complain of deafness in one or both ears, which is really a consequence of *suppuration occurring in early life, which may be entirely*

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forgotten or unknown. Even when the previous ear affection is remembered, patients seldom think it worth while to refer to it. But an examination of the ear, and an inspection of the drum-head, will reveal the consequences of disease which may have occurred at any period of life.

Often an aggravation of an old ear affection, as from a fall on the head or a blow on the ear, is recorded as the beginning of the disease caused on that occasion. This sometimes occurs, for example, in the case of a child at school. The teacher, being annoyed at the pupil's misbehaviour, thoughtlessly applies his hand or his book to the side of the child's head, and thereafter there is bleeding from the ear, pain, dulness of hearing, or giddiness. Forthwith all *the blame for causing disease of the ear is unjustly applied to the teacher*, notwithstanding the fact that the disease may have existed for months or years, and have been ready to give rise, on the slightest provocation, to serious and alarming symptoms. While slapping or striking children on the head is fraught with dangerous consequences in all cases, the possibility of the presence of an ear affection should itself deter guardians and teachers of children from inflicting even the slightest degree of chastisement over the organ of hearing.

If *defective hearing* does not immediately follow suppurative inflammation of the middle ear, it *sets in to some degree as the individual advances in years.* A patient does not necessarily suffer from complete deafness, or even from an extreme degree of dulness of hearing, owing to the formation of a perforation in the drum-head, or even from its partial destruction. Sometimes the perforation is so small that it is healed over completely. But in all cases in which the delicate tympanic membrane has been damaged or partially destroyed, like all other structures of the body affected by inflammation, it does not retain its original degree of vitality. As a result of the inflammatory affection of the drum-head, the tissue formed resembles that of a scar in the skin, which tends to contract and become firmer and harder. In course of time the degenerative change in the drum-head produces an increasing degree of deafness, the membrane, or the remaining part of it, becoming more rigid and less capable of responding to the waves of sound. The patient's hearing, up to a certain point, remains quite sufficient for practical purposes in business and social conversation; but any increase of the dulness causes him to complain emphatically of his defect.

Patients often observe that they *hear better while the ear is discharging.* That fact contributes to a considerable degree

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to the neglect of treatment of chronic ear suppuration. It is also the cause of attaching blame unfairly to medical practitioners for making such patients deafer than they were before undergoing curative treatment. The purulent fluid in the ear acts as a sort of artificial drum or conductor of sound, and so assists the patient's hearing. Of course, the presence of any other less objectionable fluid would act in the same way, without producing such disastrous results; for the purulent matter is all the while gradually destroying the soft and hard structures of the ear, and the disease is encroaching more and more upon the brain and its coverings, and also upon the great neighbouring blood-channels.

An explanation of this state of the case will convince the patient that it is absolutely necessary that his ear should be healed as soon as possible. Although patients may hear better while the discharge continues, that experience is limited, for the time comes when the destruction of the organ is so extensive that the deafness becomes permanent whether the matter be present or not. It is advisable that suppurative disease of the ear should be treated promptly in all cases, because the longer it continues the greater is the dulness of hearing. If the disease has not been allowed to produce complete destruction, various forms of artificial ear-drums may be applied, which aid the hearing very materially.

People hold *the absurd and perilous notion that a suppurating ear should not be treated.* They affirm that it is dangerous to stop the discharge, for the reason, as they erroneously maintain, that, if the matter does not come out by the ear, it will go inwards to the brain and prove fatal. They even consider it a salutary thing for matter to run from the ear. The public take this view of the course of such cases owing to the narrow limits of their knowledge and observation. They have known or seen cases of acute inflammation among their associates to whom the discharge of matter gave great relief, and therefore look favourably on its appearance at the outer orifice of the ear. Moreover, they may have learned of chronic cases in which the matter ceased to flow when the brain had become affected, and a fatal termination ensued. But they do not consider that in such neglected cases the disease was all the time making dangerous inroads on the surrounding structures until grave symptoms appeared, the infective matter having formed an abscess in the brain or set up disease in some situation within the cavity of the skull.

By healing a suppurating ear we do not mean simply and

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mechanically stopping the discharge, as some people seem to believe. The treatment is based on the same surgical principles as applied to any structure of the body similarly affected. Cleanliness is all important in the treatment of suppurative disease of the ear. It is mainly owing to the fact that cleansing is not thoroughly and regularly carried out that many cases fail to heal. Besides, the treatment requires to be continued in the more chronic cases over a long period, and patients generally give it up too soon. They either become tired of carrying it out or they become hopeless of cure. On the other hand, they sometimes conclude that the ear is cured, without giving the surgeon an opportunity of examining and giving his opinion, the result being that, in the course of a short time after discontinuing treatment, the suppuration returns as at first. It is difficult to get the patient to comply with instructions as to the treatment of a running ear. It is often necessary for the surgeon to treat the case from beginning to end with his own hands.

On account of *the unfavourable situation of the middle ear*, the matter collects, and lies decomposing, as it cannot flow away properly and be removed, as in the case of an affection of the exposed surface of the body. Free drainage, absolutely essential in the healing of any wound, is not possible in the case of the ear, owing to the position of the tympanic cavity deep down in the temporal bone of the skull. It is, therefore, necessary to remove the purulent accumulation by means of the syringe. Allowing the discharge to accumulate is undoubtedly one of the principal means of perpetuating the disease. But the treatment must be carried out properly in order to be effective. Many patients imagine they can syringe their own ears, but we have only to look at their attempts to do so to see how futile they are. Either the doctor himself should perform the operation, or, if more convenient, a relative or friend should be instructed how to do it. There is a danger of syringing too much or over too long a period. As soon as the discharge begins to moderate it should be done less frequently, otherwise it will, particularly in the hands of attendants, serve to keep up the irritation.

Certain *nostrums and drugs* have been associated with treatment of the ear, the variety of applications being greater than the remedies used for diseases of any other organ of the body. One of the most common applications is oil, especially almond oil, applied warm. The oil is even poured into ears full of fœtid matter, and only promotes decomposition. In no case of ear disease should oils be used. They are not only

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useless, but very injurious, because they become rancid and irritate the outer ear, at the same time providing a soil for the growth of micro-organisms. The application of tepid water is even preferable in the only cases in which oil may be of use—namely, for the purpose of softening accumulations of wax with a view to removal by syringing. Various kinds of soaps have been prescribed for syringing the ear, all being equally injurious. All sorts of essential oils have been used, and poured into the ear without mercy, along with turpentine, naphtha, creasote, laudanum, camphorated oil, cloves, garlic, whisky, brandy, glycerine. Some have advised the insertion of a piece of fat bacon into the ear, and others the application of part of an onion. The application of black sheep's wool is another ugly and uncleanly popular nostrum. There is also *a prejudice in favour of applying cotton wool* in all manner of ear affections. We even find people inserting it into perfectly healthy ears, as a precaution against affection by cold, as if the ear-drum were not sufficiently protected by nature. Plugs of cotton are generally stuffed into suppurating ears, and become saturated with the irritating discharge, as they are not renewed frequently enough. It is better to admit the entrance of fresh air rather than seal up hermetically a foul, decomposing cavity. Even medical practitioners themselves and druggists dispense applications more likely to produce harm than good in the cases of patients suffering from suppurative ear disease. They give what they call "ear-drops," consisting often of oil and some tincture, to be applied indiscriminately in all cases of ear trouble. Such preparations are applied to ears full of purulent matter without any previous examination or cleansing, and only aggravate the filthiness of the condition. Liniments, tincture of iodine, and blisters around the ear are commonly applied in all ear diseases, with the sole result of causing unnecessary pain. Boracic acid, ever since its introduction into medical use, has been identified with the treatment of every ear affection. It is generally prescribed in the form of powder, to be blown into the affected ear, even on the top of accumulations of purulent matter, in which case it cannot possibly effect any benefit.

There is *no panacea for ear disease.* The appropriate treatment can only be indicated by a careful inspection and correct knowledge of the diseased organ, and there can be no justification of random attempts at treatment made entirely in the dark. Medical men have been inclined in the past to minimise the gravity of ear affections, owing to their want of familiarity with the methods of examination and treatment,

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In the case of a child, parents have been advised "to leave the suppuration to nature, and the child will outgrow it," and other subterfuges, equally futile, have been employed in regard to adults. Practitioners have dealt with this class of diseases in a manner that savours of quackery or empiricism, by prescribing advice and nostrums which they would never think of giving for similar forms of disease in any other organ of the body. This unfortunate circumstance has contributed very much to the neglect of ear diseases, and to the production of the large proportion of chronic and incurable cases.

The aspect in which diseases of the organ of hearing have been all along regarded has given wide scope for *quackery*. Patients failed to find relief from legally qualified practitioners, both on account of the ignorance of the profession and also on account of the chronic and incurable character of the disease. It was no wonder, therefore, that such sufferers, despairing and disheartened, threw themselves into the hands of quacks and nostrum-mongers.

At the present time even we are daily confronted in our newspapers and journals with the alluring *advertisements of fraudulent charlatans*. For curing all the various affections of the ear the same drops, powders, lotions, and ear-drums are duly guaranteed. In all cases the treatment is not only similar but identical. It matters not to these designing and unscrupulous impostors how the ear is diseased, or, indeed, whether it is affected or not: their only aim is to extract money from their too credulous dupes, of whom there is always a large proportion among the people of all countries. Fraud is the only object of advertisers who profess to cure patients suffering from ear affections whom they have never seen. From a few symptoms detailed in a schedule sent through the post it is impossible to form an opinion: a careful examination is necessary in each case.

The *incomplete training of medical students*, and the consequent inability of general practitioners to examine and treat the various organs affected by disease, has given rise to *the practice of specialism* in the profession of medicine. But while special practice met the necessities of the public, only the more affluent private patients could avail themselves of it, because the specialists' fees were prohibitive in relation to the industrial classes of the population. Provision has been made at the medical charities for affording free treatment to poor people suffering from special diseases. Indeed, in this respect the indigent poor are more fortunately situated than their neighbours of the artizan or middle class. The poor people

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understand that such medical institutions exist for their particular benefit, and therefore unhesitatingly resort to them. Working people, who can afford ordinary medical charges but cannot spare special fees, must betake themselves to the public medical institutions, and make themselves objects of charity, before they can obtain the desired treatment of their particular ailments. Such people naturally delay for some time before taking that course, while the disease from which they are suffering is rapidly becoming worse, and passing the acute stage when it could readily be cured. This circumstance is responsible in a considerable degree for neglect of diseases of the ear among the middle classes of the population. As the members of the profession become able to deal with special diseases, the number of chronic, incurable, and dangerous cases will diminish. Patients of all classes affected with ear disease are now seeking advice earlier and in greater numbers than formerly. They are overcoming the old prejudices so long associated with this department of disease, and are aware of the fact that the profession is more competent and ready to deal with it. Within recent years aural surgery has advanced mostly in the direction of the treatment and cure of disease extending from chronic suppuration of the ear to the brain, and many lives have been saved that would have been sacrificed in former times.

I may appropriately conclude these general observations on the most common class of diseases of the ear as introductory to the course on aural surgery in this medical school, by giving a short sketch of the history of the teaching of that subject in this city. Systematic lectures on aural surgery were first given in Glasgow by the late Dr. Cassells at the Dispensary for Diseases of the Ear in Buchanan Street. He began to lecture to students and practitioners in the year 1873, and his courses of instruction were so successful that a committee of the most influential citizens was formed, about twenty years ago, for the purpose of raising a sum of money to endow a chair of aural surgery in the University. A considerable amount was subscribed and offered to the University authorities for that specific purpose, but difficulties stood in the way, and the money obtained was transferred to the fund for extending the Ear Dispensary into an Hospital, for the reason that Dr. Cassells was virtually doing the work of teaching aural surgery which had been contemplated by the founding of the University lectureship. It is now sixteen years ago since this aural lectureship in Anderson's College Medical School was inaugurated. Although the teaching of

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aural surgery has not been recognised by the University authorities until the creation of a lectureship this year, it has by no means been neglected in Glasgow.

Opportunities for clinical study of aural surgery in Glasgow have been afforded as far back as the year 1858, when the late Dr. Corbett opened a Dispensary for Diseases of the Ear. The late Dr. D. Patrick practised as the first aurist in Glasgow from the year 1845 till 1865, but he did not start any public institution. Previous to the year 1872, there was a Dispensary for Diseases of the Ear and Skin in John Street. An Ear Dispensary in Montrose Street was conducted by Dr. D. Dewar for about nine years previous to 1875. The Dispensary started by Dr. Cassells in 1872 became the Ear Hospital in 1880. Advice on ear diseases was first given at the Royal Infirmary by Dr. Dewar in 1875. About the year 1877 a department for aural disease was formed at the Western Infirmary. Since then, special cliniques for diseases of the ear have been established at Anderson's College Dispensary (now the Central Dispensary), at the Glasgow Public Dispensary, the Children's Hospital, and at the Tradeston Dispensary of the Victoria Infirmary. According to the new regulation for medical study, necessitating a course of five years instead of four, as formerly, students will have more time to devote to special branches of medicine and surgery, and will therefore acquire a more thorough knowledge of them. The trend of medical education at the present day is towards giving students a complete all-round training, including a practical knowledge of special departments of disease. Although specialists and consulting practitioners will no doubt suffer in consequence, the public health, and the medical profession in general, will reap the benefit.

NOTES OF A CASE OF MISSED LABOUR.[1]

BY ROBERT JARDINE, M.D. EDIN., M.R.C.S. ENG., F.F.P.S. GLASG.

MISSED labour is a condition of sufficient rarity to warrant me in bringing notes of the following case before you.

The patient was 42 years of age, pregnant for the thirteenth time. I had delivered her twice before: the first time, in December, 1890, of her eleventh child, by means of high

[1] Read at a meeting of the Glasgow Obstetrical and Gynæcological Society, 29th May, 1895.

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forceps; the next time, in 1893, of her twelfth child, by version for prolapse of the cord. She had been menstruating profusely every three weeks for some time, until it ceased in the last week of May, 1894. She was quite sure of the date. In August her face, arms, and legs became very much swollen, but this passed off in a short time. She quickened at the usual time, but stated that the movements were never very vigorous. She was very much stouter than she had ever been in former pregnancies. On 1st March, while stooping at the fireside cleaning the grate, the waters suddenly gushed away from her in great quantity, flooding the whole floor. She felt no pain at the time, but felt slight movements. She had irregular pains after that for a day or so.

I was sent for on the 9th, eight days after the waters had come away. The fœtal heart could be faintly heard to the left and below the umbilicus, and she still felt slight movements. By palpation the head could be made out lying above the brim and to the left. *Per vaginam* the os would admit one finger, and the head could just be reached. There were no uterine contractions.

Next day the conditions were unaltered. She promised to send for me as soon as the pains commenced.

I heard nothing more about the case until the 27th, and had concluded that the labour had either ended naturally, or that they had sent to the Maternity Branch, as her former labours had been conducted in connection with it.

At noon of the 27th, I found her having strong pains, and the head of a putrid fœtus presenting at the vulva. She stated that all movements had ceased the day after I had last seen her. She had remained in the same condition until the 23rd, when, as she termed it, she "began to alter," and this had continued. The discharge had been dark and foul-smelling. At 12 P.M. on the 26th the labour pains had begun.

The delivery was easily accomplished, and the placenta came away naturally. The fœtus, a male, apparently full time, was very soft and putrid, and the cord, which was 36 inches long, was quite black. The placenta was somewhat macerated, but did not present any abnormality. I gave an intra-uterine perchloride of mercury douche.

Next day she felt very faint, and was much troubled with flatulence, and had a bad headache, but the temperature was normal and the pulse 98. There was some pain over the uterus. She was poulticed and given quinine. After that she had no further trouble, and was up in about a week.

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Playfair, in his *Midwifery*, says:—"The term *missed labour* is applied to an exceedingly rare class of cases, in which, at full period of pregnancy, labour has either not come on at all, or, having commenced, the pains have subsequently passed off, and the fœtus is retained *in utero* for a considerable length of time. Under such circumstances it has usually happened that the membranes have ruptured at or about the proper time, and the access of air to the fœtus *in utero* has been followed by decomposition."

Was this case one of missed labour? I think it was. If we calculate from the last week in May, we find the labour was due in the beginning of March, or just at the time the membranes ruptured. Under ordinary circumstances the child would have been born at least within a few days. I have seen a week elapse between the rupture of the membranes and the birth of a live child, but never longer.

The causes of missed labour usually given are, according to Lusk, "abnormal absence of uterine irritability or of that residing in the reflex nervous centres, obstructed labour, and unusual close adhesions of the placenta." There was no obstruction to the labour, neither were there any indications of the placenta having been adherent. In a paper read before this Society, and afterwards published in the *British Medical Journal* (7th May, 1892), I gave notes of a case of prolonged gestation with complete occlusion of the os externum. That case might have been classed as one of missed labour due to obstruction, as she had pains at term, and thought the labour was coming on, but she was not delivered for nearly four weeks later—305 days from the cessation of menstruation. Her child, however, lived until the time of delivery, but was too large to be extracted alive. In the present case the "abnormal absence of uterine irritability" seems to me to have been the cause. This was brought about by the uterus having been over-distended and practically paralysed. It must be borne in mind that this was her thirteenth pregnancy, so that over-distension would have a marked effect on her uterus. I did not see the woman before the escape of the waters, but she said she had been very much stouter than with any of her other children; and both she and her neighbours assured me that so much water came away from her that it flooded the whole floor. They estimated that there had been several basinfuls. There is no doubt the quantity had been very great. The loss of the liquor amnii would account for the death of the fœtus, and the admission of air soon rendered it putrid. The labour came on, in all probability, at the time

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when a menstrual period would have occurred had she not been pregnant.

The retention of a dead fœtus *in utero* up to term is not very uncommon, especially in twin pregnancies. I have seen four such cases, where one child was born at full time alive while its fellow-twin had been dead for several months. In one of my West End Branch reports I have given notes of a case where a dead fifth month fœtus was born at term. The membranes had remained intact in all of these cases.

A good many cases of missed labour have been recorded, in some of which the fœtus had been retained *in utero* for many years. We are all familiar with the famous case of Dr. Cheston, in which the period of retention is stated to have been fifty-two years. Bland Sutton quotes this as an instance of a retained extra-uterine gestation, which it evidently was, so that it was not really a true case of missed labour. Müller, of Nancy, tried to prove that most of the recorded cases were really cases of extra-uterine gestation. The late Dr. Angus Macdonald, in a very interesting paper read before the Edinburgh Obstetrical Society, describing a case in which he removed one horn of a bicornuate uterus containing a fœtus which had been retained a year, maintained that these cases of missed labour were really cases of conception in one horn of a bicornuate uterus where there was an obstruction to the passage of the child, either from the canal of the cervix being too narrow or occluded. A few cases similar to his have been published.

There is no doubt that some of the recorded cases have really been extra-uterine gestations, while others have been similar to Macdonald's, but still some of them have been true instances of retention of the fœtus in the uterine cavity. In mine it certainly was, but, as it was only retained twenty-seven days, one almost hesitates to call it a case of missed labour.

When a decomposing fœtus is retained *in utero*, the condition is a very serious one for the woman. She is exposed to the dangers of septic poisoning, and also of ulceration of the uterine wall. Sir James Simpson recorded a case where an opening formed into the transverse colon and caused the death of the patient three months after term. If one is definitely sure that the woman has gone beyond the term, and that the fœtus is dead, the uterus should be emptied. This must be done with great care, as the walls may be thinned out very much. In my case, if the woman had sent for me when the discharge began, I would have dilated at once and have

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removed the fœtus, but fortunately Nature accomplished this unaided.

The sooner the uterus is emptied, the better chance there is of saving the woman. If the fœtus is very much decomposed —coming away in bits, as in the cases recorded by M'Lintock and others—Porro's operation would give the woman the best chance. Macdonald strongly advocated this operation, on the supposition that all the cases were conceptions in one horn of a bicornuate uterus.

ON SECONDARY PAROTITIS, WITH NOTES OF FOUR CASES.

By C. O. HAWTHORNE, M.B., F.F.P.S.G.,

Assistant-Physician to the Glasgow Western Infirmary; Clinical Assistant to the Professor of Medicine in the University of Glasgow; Lecturer on Materia Medica and Therapeutics, Queen Margaret College, University of Glasgow.

PAROTITIS, apart from mumps, has been described as an incident in association with a considerable number of pathological conditions; and the exact relationship of these conditions to inflammation of the parotid has given rise to some diversity of opinion. One group of the cases in which a secondary parotitis has been observed is affections of the generative organs. Thus, injury of the testicle[1] has been followed by parotitis, and Trousseau[2] records a case of suppressed menstruation in which, at each monthly period, an inflammatory condition of one or other parotid region occurred. Other cases, too, have been observed in which functional disturbance of the salivary glands has coincided with the occurrence of menstruation;[3] and in one case, described by Stephen Paget,[4] swelling of the parotids appeared in successive pregnancies, and was the first subjective indication of that condition. Even the introduction of a pessary into the vagina[4] has been followed by parotitis. The development of inflammation of the parotid gland under such circumstances as those just mentioned has been regarded as the converse of what sometimes happens in mumps. Orchitis is, of course, a recognised complication of that disease, and in the same disorder female patients are liable, though less frequently, to the development of inflammatory

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complications in the breasts[5] or, more doubtfully, in the ovaries.[6]

Further, it is to be noted that, in the experience of some surgeons, parotitis is specially likely to occur after operations on the female generative organs,[7] and this, too, without any indication of general pyæmia. In reference to the cause of this association between inflammatory and other disturbances of the generative organs and parotitis, various suggestions have been made. Mr. Hutchinson[8] finds an explanation difficult, "unless it be that the parotid gland and testis, when inflamed, develop elements which are mutually infective." Bumm,[9] who believes there is a special relationship between ovariotomy and parotitis, suggests that, as a result of nerve irritation following the operation, the secretion of saliva is suspended by reflex influences, and micro-organisms then enter the parotid gland through Stenson's duct.

A possible further illustration of the pathological relationships of the generative organs and the parotid gland is afforded by the occasional occurrence of orchitis[10] and (though in still more rare instances) of parotitis[11] as a result of gout.

Parotitis is also a recognised though uncommon complication of some of the specific fevers. Murchison[12] found it most frequently in typhus, and regarded its occurrence in this disease as establishing a connecting link between typhus and oriental plague. He also recognised it in relapsing fever and in enteric fever; and in the experience of other authorities it appears to have been most frequently observed in the last-mentioned. Gee[13] regards the inflammation of the parotid in these cases as the result of dryness of the mouth, the irritation extending from the buccal mucous membrane along Stenson's duct to the substance of the gland. This view has been supported by other observers, and it has been maintained that, from the very earliest appearance of the symptoms of parotitis, pressure over the duct of the parotid will cause the expulsion of a drop of pus from the orifice.[14] As the result of histological examination of the duct and gland in several fatal cases, Hanau[15] came to a similar conclusion. It is interesting, in this connection, to note the occurrence of recurring attacks of parotitis, or at least of swelling of the parotids, in cases of xerostomia or dry mouth. Several examples of this association have been described,[16] and Mr. Hutchinson, who has recorded a number of such cases, regards the two conditions as resulting from some nervous disturbance. In the majority of the cases of this character the xerostomia has been a very chronic condition, and has developed without apparent cause; but

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Hutchinson[17] also reports two cases in which dryness of the mouth, with painful swelling of the parotids, appeared on the third day after an injury (which subsequently proved fatal) to the abdomen. In each case the swelling disappeared in the course of a few days without suppuration. It is very difficult, under these circumstances, to regard the parotitis as pyæmic in character; and further, as there was in each of the patients, as an immediate result of the accident, copious sweating, followed by dryness of the skin as well as of the buccal mucous membrane, and the passage of an excessive quantity of urine, it seems a fair inference that the violence to the abdomen produced reflexly through the nervous system disturbance of the function of various glands, including the salivary glands. It is, of course, still open to argument that the parotitis was not a direct but an indirect result of this disturbance, the cessation of the salivary secretion giving an opportunity to germs or other irritants to reach the gland through the unoccupied Stenson's duct, or in some other way rendering the gland susceptible to the influence of septic agents.

The relation of parotitis to pelvic and abdominal lesions has received considerable attention from Stephen Paget, who has come to the conclusion that cases of parotitis associated with such lesions form a group by themselves. Paget questions the pyæmic origin of the inflammation. He has collected 101 cases[18] of parotitis following abnormal conditions in the pelvis or abdomen, and points out that in the great majority of these the parotitis, as an inflammatory event, was an isolated one; that in a considerable number of the cases there was no suppuration; that the attack was, as a rule, unattended by rigors or by any decided rise of temperature; and that the issue of the case was in no practical sense prejudiced by the parotitis. These facts he considers conclusive against the suggestion that the inflammation of the parotid was due to any "ordinary form" of pyæmia. Paget also rejects the suggestion that the inflammation travels from the buccal cavity backwards along the parotid duct, and instances, in support of this view, the fact that it is quite exceptional in these cases to find the *socia parotidis* specially affected, or attacked at an earlier date than the main body of the gland. The view that Paget advocates is that there is some special connection, through the nervous system, between the abdominal and pelvic viscera and the salivary glands, and that lesions of the viscera lead reflexly to a congestion of the gland which may proceed to inflammation, and even to suppuration. And

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in support of his position, he refers to the recognised influence which morbid conditions of the stomach exercise upon salivary secretion; to the experiments (upon dogs) in which inhibition of the secretion of saliva is produced when a coil of intestine is withdrawn from the abdomen, the secretion returning when the intestine is replaced; and to the occasional occurrence of salivation during pregnancy.

Besides Paget's cases, other examples of the occurrence of parotitis in connection with abdominal and pelvic lesions have been put on record. Christopher Martin,[19] after an experience including a thousand cases of abdominal section, speaks of it as a "curious complication," which "usually occurs during the second or third week, and may nearly always be traced to a septic cause." It may be noted, however, that other surgeons have observed the development of parotitis at a much earlier date. Thus, in Mr. Jalland's case, already alluded to, the parotid swelling appeared on the third day after operation. Fagge[20] describes parotitis in a case of intestinal obstruction due to cancer of the sigmoid flexure; Taylor[21] observed it following an operation for imperforate anus; H. C. Cameron[22] after abdominal section; Middleton[23] in a case of fæcal tumour, and as a complication in pernicious anæmia[24]; Grisolle,[25] from experience in the Vienna Hospital, notes it as occurring on five occasions in a total of upwards of 5,000 cases of pneumonia; Gowers[26] describes parotitis as an event in a fatal case of peripheral neuritis following a stab wound under the left clavicle, the wound "healing well;" Fagge mentions it as an occasional complication of influenza[27] and of yellow fever[28]; two cases have been noted in which parotitis complicated an attack of illness regarded as of the nature of acute rheumatism[29]; and Gee[13] records the occurrence of parotitis in a fatal case of chorea accompanied by a very dry state of the mouth and tongue.

The four cases briefly recorded below have all come under my observation in hospital practice. The first was regarded, without much doubt, as a case of gastric ulcer, though the rapidity of the convalescence may possibly introduce a question as to the accuracy of the diagnosis. In the second case, the slight development of gastric symptoms other than the hæmatemesis, and the prompt improvement of the patient leave it an open question whether the case is to be marked as one of "latent" gastric ulcer, or as belonging to the group described by Trousseau and others, in which hæmatemesis occurs without any ulceration of the gastric mucous membrane.

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In neither of these patients was there any fact, either in the history or the physical diagnosis, to suggest cirrhosis of the liver or other cause of portal obstruction. The occurrence of parotitis in cases of gastric ulcer and hæmatemesis must, I think, be a most unusual event. In Mr. Paget's[18] list of 101 cases of secondary parotitis, 18 are classified as following disease or injury of the alimentary canal, and in only one of these was there any question of the existence of a gastric ulcer. Even in this one the diagnosis was doubtful, and as the patient was at the time suffering from "two small bed-sores," it by no means follows that the parotitis was consequent upon the gastric ulceration, allowing that this was actually present.

The third case illustrates the occurrence of parotitis in lobar pneumonia; it provides an exception to the experience of Grisolle,[25] who found this complication a serious one, as in his cases the inflammation usually terminated in suppuration or gangrene. In the fourth case the parotitis may fairly be regarded as following the appearance of purulent matter in the peritoneal cavity.

CASE I.—Jean J., æt. 42, unmarried. The history gives a record of epigastric pain, with almost constant vomiting, of three weeks' duration, and, on the morning of admission to the hospital, the occurrence of a free hæmatemesis. Previous health good, except for mild attacks of gastric disturbance at intervals during the last three years. Under rest in bed, the use of bismuth subnitrate, and the absence of solid food, the stomach symptoms soon subsided, but a fortnight after admission pain was complained of under the right ear; the right parotid region rapidly became swollen and extremely tender, the temperature rising to 101° F. In the course of forty-eight hours, however, the temperature fell to normal, and the swelling gradually disappeared without suppuration.

CASE II.—Janet L., æt. 26, unmarried, admitted to the Infirmary on account of a severe hæmatemesis extending over twenty hours. The hæmatemesis was repeated three days after admission, and was followed by melæna. Four days after the second hæmorrhage, evidences of right parotitis appeared, the temperature running up to 101·8° F. Under treatment, the local condition improved and fever subsided, but after a few days' interval pain and swelling returned, and the temperature reached 102·2° F. Fluctuation could now be detected, and a large quantity of pus was evacuated on incision.

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The patient had always enjoyed good health, but had been apt to vomit her food from childhood. For a week before the hæmorrhage she had experienced some pain after food, but this had not been severe, and there had not been at this time any vomiting. Physical examination negative, except for undue pulsation in the abdominal aorta. After relief of the parotitis by incision, gastric symptoms ceased to be apparent, and patient made a rapid recovery.

CASE III.—Mary I., æt. 17, admitted with pneumonia of left lower lobe; crisis distinct on ninth day. During the next ten days patient remained well, except for a slight rise of temperature which soon passed away and for which no explanation could be found. At the end of this time she complained of pain at the left angle of the jaw and headache, and the temperature rose to 103·6° F.; no rigors; fulness and tenderness were detected over the left parotid gland. In the course of three days the temperature fell to normal, and all the symptoms had disappeared; subsequent convalescence uninterrupted.

CASE IV.—Thomas B., æt. 46. This patient was the subject of aortic disease, with amyloid changes in the viscera, and evidences of syphilis in the liver. In the latter part of his illness ascites became troublesome, and six days before death the abdomen was tapped. Two days after this both parotid glands became much swollen and very painful, and remained so until death. *Post-mortem* examination revealed the changes mentioned above, also the presence of fluid with soft yellowish fibrinous exudation in the peritoneum, and pus infiltrated through each parotid gland.

It cannot be claimed that these cases contribute any very definite support to any of the various theories suggested to explain secondary parotitis. But it may be observed that, in each one of them, opportunity existed for the entrance of septic matter into the blood, and it is, therefore, at least possible that, under certain circumstances, the parotid gland may discharge an excretory as distinct from a secretory function, and that, in the act of excreting septic or other materials, it may be "irritated" into a state of inflammation or even suppuration. That the secretion of saliva may be influenced reflexly through the nervous system there can be no doubt, but it is difficult to believe that an inflammatory swelling or suppuration can be explained in this way. And it

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may be fairly questioned whether the swelling of the parotid gland that is known to occur at intervals in cases of chronic xerostomia, and other conditions, is of the same nature as the parotid inflammations that follow lesions in various parts of the body. If secondary parotitis were due to the passage of irritants from the buccal cavity into Stenson's duct, one would certainly look for its more frequent occurrence, considering the large number of cases in which, with febrile phenomena, there is extreme dryness of the buccal mucous membrane.

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NOTE ON TWO CASES OF PAROTITIS AS A COMPLICATION OF INFLUENZA AND PNEUMONIA.

BY JOHN H. CARSLAW, M.D.,
Assistant to the Professor of Practice of Medicine, Glasgow University.

WHATEVER view may be taken as to the importance of the micro-organisms described in connection with acute croupous pneumonia and with influenza, it will be admitted that the clinical study of those diseases warrants the recognition of a very distinct relationship between them and the great specific fevers. That relationship is illustrated, for example, by their sharing the liability to certain definite complications and sequelæ. The case for pneumonia, in this respect, was strongly stated in Dr. Hector Cameron's Presidential address to the Glasgow Medico-Chirurgical Society, "On a Surgeon's Experience of Diphtheria, Enteric Fever, Scarlet Fever, and Pneumonia."[1]

One of the rarer complications of pneumonia is parotitis. Jürgensen, in *v. Ziemssen's Cyclopædia*,[2] quotes statistics showing the small percentage of cases in which it occurs (about one-tenth per cent). In two cases, which it is desired now to put on record, the parotitis followed closely upon an attack of acute pneumonia, typical in regard to sputa, physical signs, duration of pyrexia, and other phenomena. This attack of pneumonia, however, seemed in each case to develop as a complication of influenza. On reference to Althaus's monograph,[3] I find quotations, from two authorities, of cases of inflammation of the parotid as a sequela of influenza. Zülzer, in *v. Ziemssen's Cyclopædia*,[4] says that (in influenza) "parotitis with salivation is sometimes observed." It is thus quite natural to suppose that not only the pneumonia, but also the parotitis, in the present cases, may be regarded as a complication or sequela of the influenzal attack, just as both might occur as complications or sequelæ of enteric fever. In the second case it will be noted that there was the further complication of a severe intestinal catarrh. That is not unknown in pneumonia, but it is at least as common in

[1] *Cf. Glasgow Medical Journal*, 1894, vol. i, p. 376.
[2] English translation, vol. v, p. 122.
[3] *Influenza: its Pathology, Symptoms, Complications, and Sequels*, &c., 1892, pp. 266, 267.
[4] English translation, vol. ii, p. 535.

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influenza without chest complication. Both patients were beyond middle life; Jürgensen[1] says that Grisolle speaks of the patients (in pneumonia) most apt to be attacked by parotitis as those "beyond sixty years of age," while one of Althaus's references[2] is to the report in the *British Medical Journal* (11th July, 1891) of parotitis after influenza "in three old women."

The following are the essential points in the histories of the cases referred to, both of which occurred in private practice:—

CASE I.—Miss A., aged about 50 years, had been attended previously for minor rheumatic attacks, and was seen, on 24th January of this year, on account of bronchitis, râles being most abundant in the left base. The temperature was normal at that date, and patient seemed for some days to be improving, though she had not yet been allowed to rise from bed, when, on the evening of the 27th, she shivered, and was attacked by severe pains in the head and throughout the body. Next morning her temperature was found to be 103·5°; that evening (28th) it was only 100°; but an antipyretic which had been prescribed probably accounted, in great part, for this fall. On the 29th complaint was made of pain to the left of the cardiac region, respiration was hurried, there was "rusty" expectoration, and temperature had again risen to 102°. Abundant muco-crepitant râles were heard in the left base, but no friction-sound could be detected, and no tubularity of respiratory murmur or dulness to percussion. Signs of consolidation in the left base had, however, developed by the following day (30th), temperature had risen to 104°, and patient was delirious. The further progress of the case did not differ from that of a typical attack of acute pneumonia, a favourable crisis occurring on 3rd February. On that date there was complaint of pain and swelling in the right parotid region. The swelling continued to increase until 9th February, but there was no return of serious pyrexia. The part was poulticed, a piece of lint soaked in oil being interposed to protect the skin. After the 9th February a gradual subsidence of the swelling took place without suppuration, and patient's convalescence otherwise, though by no means rapid, was perfectly satisfactory.

CASE II.—Miss B., aged 60, had also had rheumatic attacks, but was in good health when suddenly taken ill on 4th March with pains all over the body. Nothing abnormal was at that

[1] *Loc. cit.* [2] *Loc. cit.*

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time detected on physical examination of the chest, but the temperature was 101°. On the 5th it was 99·4°; on the 6th, 99·2°; and on the 7th it was perfectly normal, and the chest was still free from any sign of disease. On the 9th a few muco-crepitant râles were detected in the right base, but there was no sign of consolidation, and the temperature had not risen. Examination of the chest on the 11th gave indications of improvement; temperature was normal, and patient's chief complaint was of distressing perspirations. On 22nd March the chest was found free from râle, but patient was still debilitated; on the 26th the respiratory murmur at the right base is noted as weak, and accompanied by slight dry râle.

It is to be noted that patient had all along been confined to her bedroom, and had, indeed, been constantly in bed until 18th March, while any short time after that date that she did sit up she was well wrapped up, and resting on an easy chair by the fireside. A renewal of severe pains took place on 28th March, temperature rising to 101·2°, and muco-crepitant râles being again audible in the right base. On the following day the temperature was 103°; pulse, 104; respiration, 24, and expectoration "rusty." The ordinary signs of consolidation became readily detectable over the right base, and patient passed through an attack of acute pneumonia, defervescence being somewhat gradual, but normal temperature being reached on 3rd April. From 31st March, onwards, diarrhœa proved a most distressing complication; it was temporarily checked on 6th April, but afterwards returned and continued till 16th April; at times it was so exhausting as to threaten collapse.

On 9th April painful swelling began in the region of the left parotid, and the temperature rose from normal (A.M.) to 100·6° (P.M.) Next day temperature was 101°, and the swelling had increased so as to reach from the malar prominence to the posterior border of the sterno-mastoid muscle. Poultices were applied as in the first case. On the 11th some reduction of swelling was noticed, and although it seemed at one time inevitable that suppuration should take place, this fear ultimately proved to be erroneous. Patient's convalescence has been delayed by her extreme debility, but it seems now (22nd June) to be fairly established.

Attention may be drawn to the fact that, in each of those cases, a preceding bronchitis had specially attacked the lobe afterwards the seat of the croupous pneumonia.

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As regards the parotitis, it is interesting to note that in both cases there was subsidence without suppuration, suggesting that the prognosis, in such circumstances, need not necessarily be so unfavourable as might be gathered from the statements of the authorities quoted above. The extent to which suppuration and sloughing may take place in parotitis was illustrated in a case of enteric fever under my care in Belvidere Hospital in 1889. There was no chest complication, but a parotid bubo first attracted attention on 27th June, at which date the patient, a lad of 18 years, was in his fourth or fifth week of illness, and the initial pyrexia had not yet subsided. Several incisions had to be made—the first on 2nd July, the last on 31st July—and it was only on 5th August that it could be noted that the cheek was doing well. On 21st July and succeeding days there was some discharge of pus by the duct into the mouth.

CASE OF A DOCTOR AFFECTED WITH DIPHTHERIA, WHEREIN BEHRING'S ANTITOXIN WAS EMPLOYED.

By JAS. WILLIAM WHITE, M.B.

THE early symptoms of illness in the case of Dr. F. were apparent on the morning of 20th March. Pain in the right tonsil, with difficulty in swallowing, headache and lassitude, were present, with a decided feeling of chill. When patient was seen later in the day the symptoms were intensified, and prostration was greater. The increase of throat pain called attention to a patch, fully a quarter of an inch in diameter, in centre of the right tonsil, while a soft pulse of 100 per minute, and a temperature of 101° F., raised suspicion as to nature of the case. At this point treatment was begun, which was continued throughout, and must be a factor in forming an estimate of the case. Perchloride of mercury in solutions of one-fourth to one-sixth per cent strength was regularly applied to pharynx, and large doses of tincture of the muriate of iron with strychnine, and at times chlorate of potash were employed inwardly. Strong soups, &c., and alcoholic stimulants were freely administered.

On the 21st the severity of the symptoms was greater,

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while, as the list of temperatures indicates, the thermometer registered 102·2° F., with pulse of 104. The pain in swallowing was more marked, and submaxillary glands were considerably enlarged. There was slight albuminuria. On examining the throat, the right tonsil, and part of the anterior pillar of fauces, showed an ashy-grey colour. There was a new formation, translucent, and pearly, evidently in the substance of the mucous membrane, the edges being ill-defined, though generally the lower level corresponded with the lower boundary of the tonsil. The uvula was œdematous and elongated.

The posterior pharyngeal wall and the left tonsil were of bright red colour, but free from new formation. Lower down the surface of the epiglottis was highly injected, while the upper rim of the larynx exhibited marked reddening There was no disturbance of voice. At this point two separate pieces of membrane were removed for examination. An immediate cover-glass preparation of one stained with methyl-blue (alkaline solution) revealed Lœffler's bacillus and various cocci. The other patch was cultivated and gave characteristic growths, from which a cover was prepared, and the diagnosis confirmed.

At 6·30 P.M. on this day, 5 c.c. Behring's antitoxin were injected into the interscapular space by Dr. Newman. Following this dose were a marked crisis in temperature (*vide* list), an improvement in tone of pulse which fell gradually in rate, and a general amelioration of symptoms. A cantering action of the heart was observed for a few hours. No cutaneous eruption occurred.

On the morning of 22nd March the temperature was subnormal, while pulse was of good quality at 80. Throat symptoms continued. It was noticed that the membrane had extended slightly over the anterior pillar. It had assumed a dull white appearance, and looked more prominently on the surface. The edge was well defined, and showed a tendency to detach itself; while, later on, it curled inwards, so that a probe could be inserted beneath without causing hæmorrhage. The central part had suffered molecular loss, and was thus thinner. Elsewhere, congestions were reduced. Mucus adhered to the pharyngeal wall at various points.

At 1·30 P.M. Dr. Newman made a further injection of 2½ c.c. This was followed by a trifling rise in temperature, but afterwards the records were mostly subnormal. The pulse became slow and full, and so continued to the end of the case. Throat symptoms improved rapidly. Glandular

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enlargement lessened, while the membrane, which had ceased to extend, became detached all round the edge. It was discharged in masses from the anterior border backwards, and from below upwards, ultimately leaving a linear patch on the upper part of tonsil. This, too, disappeared in thirty-six hours. From this point nothing need be recorded. The throat resumed its normal aspect. Albuminuria was found to have gone, and recovery was rapid and complete.

In regard to the feeling produced by the exhibition of antitoxin, Dr. F. himself writes:—

"The injection of such a comparatively small dose as 5 c.c. caused considerable local uneasiness for about twelve hours."

. . . "Temperature before the injection was 102·2° F., a few hours after it was 99·4° F. The degree of comfort felt was commensurate with this drop; a feeling of comparative ease being substituted for one of intense malaise, headache, nausea, and all the accompaniments of febrile disturbance disappearing."

LIST OF TEMPERATURES, &c.

		Temperatures.		Pulse.	
		A.M.	P.M.	A.M.	P.M.
March 20,	. .	...	101°	...	100
„ 21,	. .	102·2°	...	104	...
„ 21,	6·30 P.M. Injection of 5 c.c. of Behring's Antitoxin.				
„ 21,	. .	...	99·4°	...	108
„ 22,	. .	1. 98·8°	...	1. 85	...
„ 22,	. .	4. 97·6°	...	4. 83	...
„ 22,	. .	7. 97·6°	...	7. 80	...
„ 22,	. .	10. 98·2°	...	10. 80	...
„ 22,	. .	...	1. 98·6°	...	1. 80
„ 22,	1·30 P.M. 2½ c.c. antitoxin injected.				
„ 22,	. .	...	5. 99·0°	...	5. 78
„ 22,	. .	...	8. 98·6°	...	8. 80
„ 22,	. .	...	11. 98·8°	...	11. 76
„ 22,	P.M. Slight albuminuria.				
„ 25,	No albuminuria.				
	Temperature and pulse have continued normal or subnormal.				

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POPULAR THERAPEUTICS AT THE BEGINNING OF THE EIGHTEENTH CENTURY.

BY DUGALD MITCHELL, M.D.

IN the year 1731 there was published at Edinburgh, the third edition of a medical work for popular use, entitled, *The Poor Man's Physician, or the Receits of the famous John Moncreif of Tippermalloch.* Sir John, who was an eminent physician in his day, died in 1710. Who the editor of this third edition was does not appear, but that he was a thorough believer in the efficacy of the "Receits" is very evident, and in concluding his preface, he adds his "hearty prayers that the great Preserver of the Bodies and Souls of men may bless them with success to all those who may have occasion to use them." A point that strikes one very forcibly in looking over such a book as this is the multitude of remedies that are indicated for all diseases dealt with. The more obscure the disease, and the more difficult of cure, the more numerous and varied of course were the cures suggested. Fifteen, twenty, or more different and independent suggestions for the treatment of a single disease are quite common, and when one considers the multitudes of remedies that were had recourse to, drawn, as in earlier days, largely from the animal world, and many of them of the most disagreeable nature, he realises how much reason he has to rejoice in the advances made in pharmacy, more particularly within the present century. Such substances as the following were still popularly recommended:—Bile, urine, the ordure of all sorts of animals, putrefied serpents, menstrual fluid, dried placenta, snails, foxes' brains, the ashes of bones (human and others), dried toads, etc. The blood of hares, goats, bats, bulls, geese, lambs, black sheep, doves, chickens, etc., each and all had their several and specific spheres of action. Such recommendations were, of course, but a lingering legacy from the ancient physicians. Brown-Sequard's suggestion for the invigoration of the aged would not have struck Pliny as at all out of the way, and it is just possible that if we could but follow the reasoning of these old world physicians in their prescribing of such substances, we might not think them so inappropriate as we are inclined to. "Boyle, the great philosopher, esteemed human urine so highly as a medicine that he declared that a full account of its virtues would fill a volume," and urine has been compared lately by Dr. Neale with beef-tea and Liebig's extract, both of them, it

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is contended, consisting mainly of excrementitious materials. What with the modern use of thyroids, thyroid extracts, pancreatic extracts, nerve extracts, brain extracts, spleen extracts, pepsines, and other animal substances, we seem in the fair way to a recrudescence of the materia medica of old, though served up in a more enticing form.

At the beginning of the last century, and for one purpose or other, human milk, cows' milk, mares' milk, sheep's milk, goats' milk, dogs' milk, sows' milk—all were used, and under the most diverse circumstances. The value of milk in phthisis was thus quaintly extolled—"Milk doth hit all intentions for cure. It cleanseth with its serous part; it conglutinateth with its coagulating part; and nourisheth and refresheth with its unctuous part."

Milk from a *black* or *red* cow was specially recommended in diarrhœa, and it was somewhat elaborately fitted for its purpose by being boiled nine times, a little spring water being added after each boiling.

Precious stones continued to be recognised, as in many other countries, as sovereign remedies in innumerable diseases. A jasper, hung about the neck or applied to the liver, was resorted to in spitting of blood. An emerald, held in the mouth, was employed in dysentery, and a "green jasper," we are told, "or a piece of ivory borne about the pit of the stomache stayeth vomiting." A sapphire, held before a boil, was credited with arresting it, and a sapphire, or jacynth, or jasper, or diamond worn or carried, was considered effectual in restoring a lost appetite. To combat the plague even a larger variety might be resorted to—a carbuncle, ruby, agate, garnet, jacynth, or sapphire.

What it is desirable, however, to gather from such a volume as this is, not so much curiosities of practice, as an indication of the relationship which exists between the popular practice of say 160 years ago and the orthodox practice of the present, and to what extent the methods of these former days may be considered the prototypes of those in vogue now. Take, for example, the different ways resorted to for the application of heat for the relief of conditions in which we still employ it. A substitute for a bath in convulsions was the following:—"Put the part affected into an ox or sheep's belly, or other great creature's belly newly killed, and let it remain there till warm." For headache we have this recommendation:—"Sheep's lungs applied hot do much assuage the pain of the head in a continual fever." A live duck's belly applied to the painful part was had recourse to in colic. In sciatica a hot

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gigot of mutton was said to be a most effectual application. Hares' blood applied hot to gouty feet was extolled as a remedy that perfectly cureth the gout, and hot bread from the oven, dipped in fresh butter, vinegar, or spices constituted a common form of poultice in painful conditions such as pleurisy.

Again, take hæmorrhages in their several varieties. The forerunner of tannic and gallic acids may be found in the use made of the distilled water of oak tree leaves in hæmoptysis; or in hæmorrhage from the bowels—water in which the inner rind of an oak sapling had been macerated and boiled. In the advice given to "rub and bind the extreme parts" for the arrest of certain bleedings, it is probable we have the same treatment recommended that is still resorted to in severe hæmorrhages—viz., ligature of the limbs. Recently I have seen an old woman applying a piece of worsted round the little finger of a patient in order to stay epistaxis! May we not find in this a very literal following of the above instruction to bind the extreme parts, but without knowing its origin or the reason why? A very radical remedy for the same condition, yet one quite in keeping with recognised principles, was to "apply cloths wet with vinegar and water to the whole body till the patient trembles."

A method of coagulating the blood locally, which makes us think of the modern use of horse hair in the treatment of aneurism, was the putting into the nostrils of the hairs of a hare mixed with white of egg or vinegar. In menorrhagia, astringent injections such as the juice of strawberries and their leaves, or of plantain was had recourse to, and this application was reinforced by the use of "pessaries of the leaves of purslain, plantain, or knot-grass, or some other convenient herb, bruised and rolled in a piece of fine linen put up in the womb." In the same condition, and in order to produce derivative or revulsive effects, it was advised to "fasten a very large cupping glass to her dugs, but take it quickly off again." Uterine prolapse was treated by reduction, followed by injections of the decoction of galls, or, in bad cases, by the use of pessaries "made of cork, smeared over with wax, or made of wax alone, round or long." A method of reduction spoken of was, to say the least of it, decidedly primitive. It was to "affright the patient with a red hot iron in your hands, threatening to burn the part."

The chief value of a plaster made of clay and vinegar, to be applied to the breasts in galactorrhœa, would probably be found in the support afforded. Another application, which was said to "suffer them not to grow great," was made up of

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honey, wax, and doves' dung, and this also, whatever else it did, would afford the necessary support. This supporting method of treatment was practised also in parotitis, in which a plaster composed of glue, resin, and wax in equal proportions was recommended.

Fissured nipples were dressed with an ointment composed of the inner bark of the elder tree, grease, and wax—a composition that may have acted as a good substitute for tannic acid and spermaceti, being on the same lines. The remedy that was most highly esteemed in the treatment of suppurating ears was the juice of the leaves of the willow—a substance which, in all probability, was, though unrecognised, effective, from its antiseptic properties. Modern antiseptics in chest diseases we may consider forestalled by the giving of tar in pneumonia; pitch, made up with honey, in "short-windedness;" venice turpentine in empyema; and turpentine in various other lung affections.

With regard to the treatment of dysentery, we can see a seeking after astringents in the use made of "iron water," "steeled milk," the juice of ground ivy, &c.; while the value of protective substances we may find recognised in the recommendation to "roast a young pigeon stuffed with wax, and give it to the patient." For the relief of pain and tenesmus, an emollient application in the form of a suppository of goats' suet was prescribed.

When a pin was swallowed, the patient was instructed to sup fat broths and eat much butter. In similar conditions we might with advantage follow the same lines, and secure a helpful lubricating effect by giving considerable quantities of olive oil.

"If it [iliac passion] come of the circumvolution of the intestines, which is either from wind or a hernia, the last remedy is to apply a smith's bellows to the anus, and blow in the belly." The idea is as old as Hippocrates, and like treatment has been not unfrequently tried in our own days, though carried out after a more refined fashion.

Eye diseases, as was to be expected, claimed a host of remedies. A soothing application was found in pigeons' blood, which was to be dropped in frequently. "If clouds appear in them, they must be scoured off with sugar-candy finely powdered." Probably the cure in such a case would not be due to "scouring," but to the stimulation facilitating absorption. It is also noted that "a drop of the patient's urine powerfully drieth up tears"—a primitive wash which

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is still employed for this purpose in some parts of the country.

The stimulating method of treating alopecia was effected by rubbing the head over with onions, or by using the burnt ashes of goats' hoofs rubbed up with pitch. Pitch, when combined with sulphur, was also used as an external application in pleurisy; while in rheumatism a substitute for the blister or other counter-irritant was found in the vigorous application of nettles. Ashes of burnt egg-shells were had recourse to for absorbent purposes.

In ulceration of the nostrils a primitive carbonaceous application was obtained by snuffing up the smoke from wax candles, which was said to "powerfully dry up the ulcers."

A local application resorted to in erysipelas and burns was raw eggs, and, on the principle of excluding the air, they would probably constitute an effective dressing. Blood was also recommended in the treatment of burns, and, on the principle of protection, we can imagine it to be effective though gruesome. For the purpose of "drying up" burns, the ashes of burnt bark were sprinkled upon the raw moist surface.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING VIII.—15TH MARCH, 1895.

DR. CHARLES WORKMAN, *Vice-President, in the Chair.*

DISCUSSION ON DIPHTHERIA, LIMITED TO THE ETIOLOGY, DIAGNOSIS, AND PROGNOSIS OF THAT DISEASE AND ITS TREATMENT BY SERUM.

DR. R. M. BUCHANAN.

FROM the time of Bretonneau's description of diphtheria in 1826, the pellicular membrane has been regarded as the most constant and characteristic feature of the disease, and the one held to be essential to its identification. When we consider, however, that membrane is simply a fibrinous

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exudate, which may result in a number of inflammatory processes besides diphtheria, its untrustworthiness as a means of diagnosis becomes apparent. Thus, whilst a large number of cases of diphtheria declare their true nature by the presence of an unmistakable exudate, there are others in which it is so equivocal that the clinician is unable to decide whether the disease is to be ranked as diphtheria or as a simple inflammation. Again, diphtheria is frequently met with in cases in which the exudate does not appear as a membrane, but in the guise of a follicular tonsillitis; and, further, cases are occasionally seen in which the local manifestations are confined to redness and swelling. From the point of view of clinical experience, therefore, the differentiation of diphtheria from other affections is frequently beset with great difficulty, and has become involved in much confusion.

Happily bacteriology has thrown a flood of light on the whole subject. The discovery of the specific contagium of diphtheria, the Klebs-Lœffler bacillus, has afforded a test by which the disease may be differentiated from other membranous affections. It has also led to a truer conception of the whole morbid process, and gone far already towards placing the prophylaxis and treatment of the disease on a rational basis.

The detection of this bacillus, therefore, becomes a most essential factor in diagnosis, and I have the honour, in opening this discussion, to direct attention especially to the methods employed for this purpose, and at the same time to bring facts elicited by bacteriological study into relation to the symptomatology and pathology of the disease. The inquiry presents itself naturally in three divisions, in accordance with the postulates formulated by Koch for the recognition of a microbe as the specific cause of a disease—namely, (1) the microscopical examination of the fibrinous exudate for the bacillus of diphtheria; (2) the cultivation of the bacillus on artificial media; and (3) the production of the disease by inoculation of a pure culture in a healthy animal.

Microscopical Examination.

The formation of the membrane in diphtheria is preceded by the colonisation of this microbe on the mucous surface. This takes place, in by far the largest number of cases, in the pharynx, and the sites next in order of frequency are the nose, the larynx and trachea. The comparatively frequent

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implication of the pharynx is probably dependent on the readiness with which the tonsils may arrest the virus in transit backwards by means of inspired air or saliva, on the fitting nidus offered by the tonsillar crypts for its undisturbed growth, and on the fact that the surface is so often in such an unhealthy condition as to offer a very suitable soil.

A small portion of the exudate is removed from the throat by means of forceps or a cotton-wool swab, freed of moisture as much as possible, and drawn to and fro on a slide. The thin layer which results is allowed to dry, and then fixed by heat in the usual way. In the thin portions of membrane which have adhered to the slide, appropriate staining will show the bacilli characteristically grouped in small colonies—the rods often lying side by side in a certain parallel arrangement —and also distributed singly or in pairs, end to end or side by side. In acute cases they may appear almost in pure cultivation. Their number, moreover, may not be commensurate with the rapid formation and spread of the membrane, as in laryngeal and tracheal diphtheria, in which bacilli may be remarkably sparse. In pharyngeal exudate of some standing they are usually associated with a large number of other bacteria. It frequently happens, however, that microscopical examination entirely fails to place the diagnosis beyond doubt. Indeed, it may be said that it cannot be implicitly relied on in any case, and culture experiments must be undertaken as a routine practice.

Concomitant Microbes.—As diphtheria is localised to mucous membranes freely exposed to the air, the bacillus is always accompanied by other microbes, some of which are capable of influencing the course of the disease, and modifying its characters. Prominent amongst these are the streptococcus, staphylococcus aureus, coccus Brizou of Roux, capsule coccus, and bacillus coli. Specially severe cases appear to owe their malignant character in a large measure to what Frænkel has called the pathological efficiency of these concomitant microbes.

Streptococci are very frequently present in pharyngeal and nasal diphtheria, and make a very decided impression on the morbid process. In different cases they appear to have different proliferative powers. If, through unfavourable circumstances, the resistance of the body is diminished, or if the virulence of the streptococci is increased, they penetrate into the deeper tissues, and may wander in thick swarms along the lymphatic channels, extend through the walls of blood-vessels, and be disseminated throughout the internal organs. Thus superadded to diphtheria we have a greater or

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lesser degree of septicæmia, with its contribution of high remittent fever and baneful influence on the heart. The local changes which this microbe is capable of producing on its own account are well exemplified by the acute inflammatory processes which it is capable of producing in several parts of the body. Thus, in the throat especially, it can alone or in conjunction with the staphylococcus give rise to membranous affections, clinically indistinguishable from true diphtheria. In cases of diphtheria, this streptococcus induces inflammatory or necrotic changes in the substance of the affected mucous membrane, and in the lungs and serous cavities. These changes are especially characteristic in the lymphatic glands, which become more or less swollen, the swelling sometimes extending to the periglandular tissue, and causing a diffuse hard swelling of the neck. This condition sometimes ends in suppuration with sloughing, and cultivation experiments reveal the streptococcus and the absence of the diphtheria bacillus. According to Roux, the virulence of the diphtheria bacillus is heightened through symbiosis with streptococci.

The *staphylococcus aureus* occurs in a considerable number of cases, and, according to Escherich, is more frequently met with in the laryngeal than the pharyngeal diphtherias. Penetration into the blood-stream and internal organs is comparatively rare, with the exception of the lungs, which it reaches by means of aspiration. The clinical course of the disease does not appear to be much influenced by this microbe.

A small coccus, first observed by Roux, and named by him *coccus Brizou*, is also a common attendant of the diphtheria microbe. It is generally found in mild cases.

The *capsule coccus* is not infrequently met with, and sometimes appears to add its special complication of pulmonary inflammation.

A *short rod*, similar in appearance to the bacillus coli, has been found by Escherich in severe cases attended by ulcerative processes in the air-passages.

Cultivation Experiments.

The cultivation of the bacillus of diphtheria on artificial media has now been brought to great perfection. The bacillus thrives especially in media rich in albumen, as blood serum, meat-peptone-bouillon, and the latter solidified with agar-agar or gelatine. Lœffler found that the addition of blood serum and glucose to bouillon gave the most vigorous growth. The medium must be of a weak but distinctly alkaline reaction.

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Vegetative growth is most luxuriant between 33° and 37° C. *Below* this optimum the growth is slower, and practically ceases at about 20°; *above* it, the growth is also slower, ceasing at 40°, with diminution of virulence.

A portion of membrane is removed, as already described, and rubbed on the surface of solidified serum or agar-agar in test-tubes or covered capsules. These are placed in an incubator at 37°. When the cultures cannot be made at the bedside, the piece of membrane or swab may be placed directly in a tube or bottle tightly corked for transport. A small tabloid tube is very convenient for the purpose.

On solidified *blood serum* the growth is very rapid at the body temperature, and very characteristic. It becomes apparent to the naked eye in about twelve hours, in the form of small transparent colonies, which, about six hours later, become white with sharply defined steep serrated margins and a dome shape. In twenty-four to forty-eight hours the colonies may have attained a diameter of 3 millimetres, with a peculiar moist appearance, and the colour tending to a slightly yellowish tint.

In *agar* (meat-peptone-bouillon and agar) the microbe displays a peculiarity which may be said to indicate a biological characteristic of this and other pathogenic bacteria—namely, that it accustoms itself more and more in succeeding generations to a medium originally unsuitable. Agar yields very characteristic growth—more especially if it contain about 6 per cent of glycerine—in twelve to eighteen hours, similar to, but less exuberant than, that on blood serum. In comparison to blood serum, its preparation is difficult and tedious, but in its practical usefulness for the purposes of diphtheria diagnosis, it is quite as efficient and as valuable as serum.

Gelatine (meat-peptone-bouillon and gelatine) is a medium of considerable practical value in the cultivation of the diphtheria bacillus. The growth is necessarily much slower than on other solid media, as the highest temperature that can be reached without liquefying the gelatine is 24° C. At this temperature the growth is microscopically visible in twenty-four hours in the form of minute granular, sharply defined, disc-like colonies. These become visible to the naked eye in other twenty-four hours as extremely minute points, the surface colonies showing more rapid growth by a marginal extension which appears as a delicate halo.

Egg albumen affords a very suitable soil, which deserves special mention from the ease with which it may be prepared. The inoculation of a raw egg yields an abundant growth

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without causing any very essential change in the appearance or odour of its contents. On sloped tubes or strips of cooked white of egg the growth is very similar to that on serum, but not easily distinguished with the naked eye.

Potato is not well adapted for the growth of the bacillus, from the fact that the reaction is, as a rule, slightly acid. A certain amount of growth appears when the surface is rendered alkaline by 2 to 5 per cent of soda solution.

In *bouillon* kept at the temperature of the blood, the growth causes a very characteristic diffuse fine muddiness from the formation of minute colonies which quickly sink to the bottom, forming a dust-like sediment, or adhere to the sides of the test-tube, while the fluid itself remains clear. The growth brings about very notable changes in the reaction of the bouillon first observed by Roux and Yersin. The addition of litmus to the medium reveals the fact that the bouillon becomes acid in the course of the second or third day, but returns again to its alkaline condition after some time, the duration of which varies from three to seven weeks. This *return reaction* depends on the supply of oxygen. Thus, it does not occur when the air is rigidly excluded, and, on the other hand, it may be brought about as early as the fifth day by the transmission of air. The *acid reaction* evolved in the medium causes the microbe to lose its virulence. The previous addition of glycerine hastens and augments this reaction.

Milk is very favourable to the growth of the diphtheria germ, being, in fact, comparable to bouillon; but it is not serviceable for the making of diagnostic cultures.

Examination of Cultures.

The morphological characters of the bacillus of diphtheria can only be fully studied in pure cultures. It appears as a plump rod, having a length roughly comparable to that of the tubercle bacillus or to the diameter of a red blood corpuscle. It is plump as compared with the bacillus of tubercle, being about twice as broad, slightly curved as a rule, and rounder at the ends. One of the ends is somewhat thicker than the other, giving the organism more or less of a club shape. The morphological characters are, however, subject to striking variations, according to the age of the culture and the nature and reaction of the culture medium. The club shape becomes more manifest with the age of the culture, and, finally, so-called degeneration or involution forms appear, in which

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the organism is seen to have become greatly elongated and probably more or less distorted.

The use of staining reagents is necessary for the full display of these and other distinctive appearances. Almost any of the ordinary aniline dyes may be employed, but the result differs according to the strength of the stain. With strong solutions, such as carbol-fuchsin on aniline-gentian-violet, the colour is absorbed with great rapidity and intensity, and the bacillus appears uniformly stained from end to end, and apparently increased in length and breadth. Such strong solutions are useful only for defining the contour of the organism, and rendering it conspicuous amongst other species, as in preparations from the throat. A weak stain is necessary for the differentiation of the cell contents, and for this purpose a weak watery solution of methylene-blue, fuchsin, or gentian-violet gives excellent results. The solution known as Lœffler's alkaline-methylene-blue, consisting of 30 parts of saturated alcoholic solution of methylene-blue and 60 parts of 1 : 10,000 solution of caustic potash, is most generally used. The solution stains sufficiently in about two minutes, and is hastened by gentle heating. At the same time, preparations may be left in the solution over night without harm. Thereafter they are placed for a few seconds in a 1 : 200 solution of acetic acid, if further differentiation is required, washed in water, and either examined at once in water or dried and mounted in balsam.

The bacillus appears by this method of the same size as in the unstained condition. It shows an unequal staining of its protoplasm (unless in the earliest stages of growth, when the organism appears smaller and stains uniformly), parts of the protoplasm in the form of discs and granules being deeply stained ("chromatic substance") and separated from one another by uncoloured portions ("ground substance"), giving the rod a segmented appearance. A contrast staining of the protoplasm is obtained with carbol-fuchsin and Lœffler's solution, in which the ground substance is red and the chromatic substance blue.

This differentiation of the protoplasm is at first sight extremely suggestive of spore formation, but closer observation fails to reveal typical endogenous spores. The mode of reproduction is not yet clearly made out. It is to be observed, however, that the elongated club-like form assumed by the organism in full development bears a close resemblance to the formation of conidia by some of the higher fungi, and may be charged, like the conidia, with a reproductive function.

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The pseudo-diphtheria bacillus.—A bacillus presenting the characters of the bacillus diphtheriæ is often found in the mouth of healthy individuals. It is known as the Hofmann-Lœffler bacillus, and often designated the pseudo-diphtheria bacillus. Certain minute cultural differences have been noted by Escherich as distinguishing the pseudo-bacillus—namely, colonies pure white and more moist on serum; more luxuriant growth on agar; more rapid growth in gelatine, growing even under 20° C.; more rapid growth also in bouillon, the fluid remaining alkaline, or, if it becomes acid, the return to alkalinity takes place quicker. The bacilli are shorter, thicker, and frequently swollen in the middle. They present the same tendency to parallel arrangement as the true bacillus. All these differences are very trifling, and are not always to be distinguished. Roux and Yersin found that the two bacilli showed no essential difference in their growth on serum, and that the organisms could not be distinguished except by inoculation experiments, the pseudo-bacillus being harmless. They consider, therefore, that the pseudo-bacillus is simply the true bacillus with its virulence attenuated. In common with other observers, they found the pseudo-bacillus in a large number of children not affected with diphtheria. It is believed also by these observers that, under the influence of special circumstances, as of symbiosis with streptococci, the pseudo-bacillus can regain its pathogenic powers, and give rise thus to genuine diphtheria. Experiment has not yet, however, confirmed an opinion which, if true, would afford an ingenious explanation of many cases of sporadic origin.

This pseudo-diphtheria bacillus, then, at first sight, presents a serious difficulty in bacteriological diagnosis. It is, nevertheless, a matter of common experience that the finding of a bacillus with all the morphological and cultural characters of the bacillus of diphtheria is the most reliable means of diagnosis.

It is important to bear in mind, in connection with this part of the subject, that after an attack of diphtheria the bacilli may remain in the mouth for weeks or months. These bacilli may retain their virulent potentiality, and so be the means of communicating the disease to others, or gradually lose it, and, it is reasonable to believe, pass by degrees into into the harmless pseudo-bacillus. We have in this retention of the bacilli in the mouth a source of infection hitherto undreamed of, and a possible explanation of the origin of a large number of sporadic cases.

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EDITED BY

JOSEPH COATS, M.D.,

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JOHN LINDSAY STEVEN, M.D.,

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ORIGINAL ARTICLES.

THE CAUSES OF THE NEGLECT OF SUPPURATIVE EAR-DISEASE.[1]

BY JAMES ERSKINE, M.A., M.B.

DISEASES of the ear have been neglected more than affections of any other organ of the body. That circumstance arises from a variety of causes more or less directly related to the situation and structure of the organ of hearing, as also to the characteristic features of the diseases affecting it, and the aspect in which they have been regarded by the general public and the medical profession.

In considering the subject of suppurative disease of the ear, the prominent outer ear or auricle may be almost entirely disregarded, along with the external auditory meatus or canal extending inwards for a distance of about an inch. The auricle and external passage together form the outer ear, as distinguished from the middle and inner ear. The part of the organ with which we are mainly concerned is *the middle ear*, which is also known by the names of tympanum, tympanic cavity or tympanic chamber, ear-drum or drum-cavity, these terms being employed quite synonymously. The membrana

[1] An Address, delivered 1st May, 1895, introductory to Course on Aural Surgery at Anderson's College, Glasgow.

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tympani or tympanic membrane, drum-head or drum-membrane, forms the partition wall between the middle and external ear. That diminutive membrane, measuring only a quarter of an inch in diameter, is often erroneously termed the "drum of the ear." It is the structure of the middle ear most subject to disease, and to partial or total destruction, usually described as a perforation or hole in the drum, or, as it should be correctly stated, in the drum-head, because it only forms the outer wall of the drum-cavity.

The middle ear is a small air chamber, about half an inch in height and width, and from a twelfth to a sixth of an inch deep, measured from the drum-head inwards. It is lined with a most sensitive mucous membrane, which also covers the drum-head on its inner surface. The mucous covering is continuous with that of the back of the throat and nose through a minute passage, the Eustachian tube, extending directly from the front wall of the drum for a distance of about an inch and a half. It is thus evident that the drum-cavity may be approached from the upper and back part of the nose and throat. From that quarter disease most commonly invades the ear, for affections of these situations are the usual causes of inflammation of that organ. The three small bones, or ossicles, named from their shape, the malleus or hammer, the incus or anvil, and the stapes or stirrup form a bridge across the middle ear, the one end of the arch being fixed in the drum-head, and the other in a small oval opening or window in the inner wall of the cavity, which communicates with the delicate contents of the internal ear or labyrinth. Behind and below the oval opening is another, round in shape, and closed by a membranous structure, called the internal or secondary tympanic membrane. The inner wall of the tympanic cavity is composed of hard bone. A ridge may be observed in the dried bone behind the oval opening, which is formed by the course of a small canal conveying the nerve which controls the muscles of the face.

The extension of acute and chronic affections of the drum of the ear to the facial nerve may produce paralysis of the corresponding side of the face. The implication of that nerve by disease of the middle ear may indirectly affect the eyesight, the patient being unable to close the eye, which, therefore, suffers from exposure. By extension of disease to a branch of the facial nerve, the chorda tympani, passing through the drum-cavity, the sense of taste may be also impaired. Smell may be affected, owing to the inability of the patient to dilate the nostrils. Even the development of the structures of one

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side of the face may be arrested, and permanent disfigurement result, if extensive affection of the ear occur in young children.

The roof, or upper part of the tympanic cavity, consists of a very thin plate of bone, which forms the partition separating it from the interior of the skull containing the brain. Disease often extends from the ear in the direction of the cranial cavity, and sets up very serious, if not fatal, disease of the brain and its coverings.

There is a small communication opening on the back wall of the drum-cavity, and leading to the bone behind the ear, termed the mastoid process of the temporal bone. Inflammatory affections extend from the ear to the cell-spaces in that bone, and excite destructive and wide-spreading disease. In some cases the purulent accumulation bursts through the skin over the bone behind the ear, and establishes a permanent suppurating channel.

Under the floor of the tympanic chamber runs the jugular vein on its way to the lower part of the neck. Ear disease implicating that large blood-vessel is often attended with disastrous consequences.

In front of the drum-cavity, and separated from it only by a thin layer of bone, is situated another large vessel, the carotid artery, which may be affected by disease or injury involving the ear.

Extension of middle ear disease may also take place through the inner wall of the cavity directly to the internal ear, and affect the structures of the labyrinth, resulting in total deafness, giddiness, or brain disease.

Distant parts of the body may be affected by the disease in the cavity of the drum, such as the lungs, and even the bowels, the infection being carried from one organ to the other by the circulation of the blood stream.

The tympanic cavity, situated deeply in the bone of the skull, may be affected with chronic disease while the patient is quite unaware of its serious and dangerous nature. He may not consider it worth while mentioning to relatives or friends. Even his medical adviser is not informed of it in the course of attendance for various illnesses.

Chronic suppurative disease of the ear continuing so long, people affected become quite accustomed to the slight discharge of purulent matter. They acquire the objectionable habit of removing the pus with the handkerchief, and think little of it. Indeed, those who come into close contact with them are often the first to express some sense of annoyance. In many cases the odour from the diseased ear is so offensive that

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although the patient tolerates it, his neighbours will evade him as much as possible. While the fœtid odour of the discharge is a decided indication of the ear affection invading the bone, the matter may be only slightly, or not at all offensive, and yet the disease may be very serious. A person, therefore, suffering from otorrhœa, or a running ear, cannot console himself that his case is not dangerous because the matter is odourless. A discharge from the ear is always an indication of serious and advancing disease.

Patients affected with suppurative affection of the organ of hearing are inclined to postpone treatment more than any other class of sufferers. There is, of course, a natural tendency to put off the necessity of seeking medical advice as long as possible in all cases. The probable inconvenience and fear of pain that may be incurred by medical examination, the anticipated trouble of the necessary attendance for carrying out the treatment, and perhaps also the additional financial consideration, all act more or less in inducing delay in consulting a doctor. In the case of chronic ear disease, moreover, *the absence, as a rule, of pain* keeps the patient from applying for advice. Although middle ear disease is painful in its acute stage, it is seldom troublesome in that respect in its chronic course. Frequently it is the case that the ear has first been acutely affected in infancy, when it has not been observed, or in course of infectious diseases such as scarlet fever, measles, or diphtheria, the affection being masked or obscured at the time by the general or constitutional symptoms. The acute stage of ear disease may occur in these circumstances, and the chronic period sets in thereafter, and continues, as a general rule, without pain.

The ear should always be examined in the early stage of the illnesses of infants and young children, and in all infectious fevers and throat affections; a large proportion of chronic and incurable ear disease would thereby be prevented. Particularly in the case of infants should attention be directed to the ear. Acute inflammatory mischief in the middle ear may produce serious consequences in the case of a baby. It may give rise to great restlessness and fever, with symptoms of affection of the brain. As the child can give no indication of the seat of the trouble, an examination of the ears should always be made at once. Not only in the case of children, but also in adult patients, *acute inflammation of the middle ear is often allowed to run its course* until the purulent accumulation forms, and, having burst through the drum-head, is observed flowing from the outer ear.

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The walls of the drum being composed of bone except at the drum-head, the fluid forming in the course of inflammation soon fills the cavity, and exerts pressure all round, making its way through the membrane, being the place of least resistance. The severe pain suffered in acute middle ear disease arises mostly from the presence of the pent-up fluid on the sensitive mucous covering of the cavity. The pain generally ceases after the drum-head yields, and gives exit to the accumulation of fluid. The patient suffering from acute inflammation of the ear prays that it may burst, and to hasten that consummation he applies heat by various means, such as poultices, fomentations, steam, hot salt, roasted onions, or figs, &c., and endures the agony till the rupture takes place, believing that there is no alternative treatment. In the case of the child the nurse or mother applies similar remedies, and waits for the appearance of matter, and is thankful to see it, as indicating the cause of the child's illness, and at the same time the probable termination of its suffering. Both in the case of the adult and the child a careful inspection of the drum-head would indicate the treatment which would arrest the disease in its earliest stage. If it is ascertained that fluid has already formed in the drum cavity, an almost painless puncture in the tympanic membrane will allow it to escape, and will prevent extension of the inflammation. A minute wound produced in that way will heal perfectly, while a perforation of the membrane occurring in the course of disease takes long to form, and is likely to be permanent.

It is from the point of bursting of the collection of matter through the drum-head that *the commencement of the chronic stage or period of neglect* may be dated. Patients feel so much relieved after the acute suffering that they consider that the inflammation has run its course, and that the rest may be left to nature. In a certain proportion of cases the discharge of matter ceases after a period of weeks or months, and the ear heals without any treatment; but in most cases that fortunate termination does not take place. Gradually the amount of the discharge becomes less, and the patient takes little or no notice of it. But the continuance of the suppuration, although the quantity of the matter is very slight, is fraught with serious consequences. Indeed, those cases are really more dangerous in which the purulent fluid lies in the drum cavity decomposing, setting up irritation, and spreading disease all around, without making any appearance at the outer orifice. In some cases the discharge is only observed at intervals, the patient noticing nothing at other

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times. He is sometimes led, on that account, to infer that the disease has ceased, until he is again reminded of its continuance by the reappearance of the suppuration.

Patients generally allow long periods of time to elapse before seeking advice about aural affections. Years may pass before any treatment is adopted. When such patients consult a doctor, they are strongly inclined to minimise the length of time during which the ears have been affected. They speak rather indefinitely of the duration of the disease, and are slow to admit that it has lasted a long time.

As a rule, patients do not call upon a surgeon owing to the discharge of matter from the ear, but rather on account of some resulting symptom which has appeared for a comparatively short period. For example, *the appearance of blood* flowing from the ear may be observed, and give rise to much alarm. When such patient states his complaint to a surgeon, he will likely only mention the duration of the bleeding, and omit to say that the ear had been affected for months or years previously. Or a patient may complain of *increasing dulness of hearing,* which he has had much occasion to notice within a recent period. Other consequences of chronic suppurative disease may cause a patient to consult a medical practitioner, such as *giddiness, noises in the ear, pain,* or some sense of irritation. The patient does not understand that all these complaints are merely the results of the long-standing disease in the ear. As the suppuration continues, granulations, polypi, and various other growths form, which, being abundantly supplied with delicate blood-vessels, very readily give rise to bleeding from the outer ear. The hearing, as a matter of course, becomes more and more affected by the gradual destruction of the drum-head, and the structures in the drum cavity. The increase of the deafness is very gradual at first, but it finally reaches a stage when it becomes a positive defect and inconvenience to the patient in his social and commercial relations.

Patients suffering from a result of suppurative ear disease, such as deafness, generally make an exclusive complaint of the symptom. It is only when the doctor makes an inspection of the ear that he ascertains the cause of the dulness of hearing or other complaint. He finds the outer ear full of matter, and draws the patient's attention to the fact, who will likely remark—"Oh, it has been running all my life," or "for years," as the case may be. Patients often complain of deafness in one or both ears, which is really a consequence of *suppuration occurring in early life, which may be entirely*

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forgotten or unknown. Even when the previous ear affection is remembered, patients seldom think it worth while to refer to it. But an examination of the ear, and an inspection of the drum-head, will reveal the consequences of disease which may have occurred at any period of life.

Often an aggravation of an old ear affection, as from a fall on the head or a blow on the ear, is recorded as the beginning of the disease caused on that occasion. This sometimes occurs, for example, in the case of a child at school. The teacher, being annoyed at the pupil's misbehaviour, thoughtlessly applies his hand or his book to the side of the child's head, and thereafter there is bleeding from the ear, pain, dulness of hearing, or giddiness. Forthwith all *the blame for causing disease of the ear is unjustly applied to the teacher*, notwithstanding the fact that the disease may have existed for months or years, and have been ready to give rise, on the slightest provocation, to serious and alarming symptoms. While slapping or striking children on the head is fraught with dangerous consequences in all cases, the possibility of the presence of an ear affection should itself deter guardians and teachers of children from inflicting even the slightest degree of chastisement over the organ of hearing.

If *defective hearing* does not immediately follow suppurative inflammation of the middle ear, it *sets in to some degree as the individual advances in years.* A patient does not necessarily suffer from complete deafness, or even from an extreme degree of dulness of hearing, owing to the formation of a perforation in the drum-head, or even from its partial destruction. Sometimes the perforation is so small that it is healed over completely. But in all cases in which the delicate tympanic membrane has been damaged or partially destroyed, like all other structures of the body affected by inflammation, it does not retain its original degree of vitality. As a result of the inflammatory affection of the drum-head, the tissue formed resembles that of a scar in the skin, which tends to contract and become firmer and harder. In course of time the degenerative change in the drum-head produces an increasing degree of deafness, the membrane, or the remaining part of it, becoming more rigid and less capable of responding to the waves of sound. The patient's hearing, up to a certain point, remains quite sufficient for practical purposes in business and social conversation; but any increase of the dulness causes him to complain emphatically of his defect.

Patients often observe that they *hear better while the ear is discharging.* That fact contributes to a considerable degree

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to the neglect of treatment of chronic ear suppuration. It is also the cause of attaching blame unfairly to medical practitioners for making such patients deafer than they were before undergoing curative treatment. The purulent fluid in the ear acts as a sort of artificial drum or conductor of sound, and so assists the patient's hearing. Of course, the presence of any other less objectionable fluid would act in the same way, without producing such disastrous results; for the purulent matter is all the while gradually destroying the soft and hard structures of the ear, and the disease is encroaching more and more upon the brain and its coverings, and also upon the great neighbouring blood-channels.

An explanation of this state of the case will convince the patient that it is absolutely necessary that his ear should be healed as soon as possible. Although patients may hear better while the discharge continues, that experience is limited, for the time comes when the destruction of the organ is so extensive that the deafness becomes permanent whether the matter be present or not. It is advisable that suppurative disease of the ear should be treated promptly in all cases, because the longer it continues the greater is the dulness of hearing. If the disease has not been allowed to produce complete destruction, various forms of artificial ear-drums may be applied, which aid the hearing very materially.

People hold *the absurd and perilous notion that a suppurating ear should not be treated.* They affirm that it is dangerous to stop the discharge, for the reason, as they erroneously maintain, that, if the matter does not come out by the ear, it will go inwards to the brain and prove fatal. They even consider it a salutary thing for matter to run from the ear. The public take this view of the course of such cases owing to the narrow limits of their knowledge and observation. They have known or seen cases of acute inflammation among their associates to whom the discharge of matter gave great relief, and therefore look favourably on its appearance at the outer orifice of the ear. Moreover, they may have learned of chronic cases in which the matter ceased to flow when the brain had become affected, and a fatal termination ensued. But they do not consider that in such neglected cases the disease was all the time making dangerous inroads on the surrounding structures until grave symptoms appeared, the infective matter having formed an abscess in the brain or set up disease in some situation within the cavity of the skull.

By healing a suppurating ear we do not mean simply and

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mechanically stopping the discharge, as some people seem to believe. The treatment is based on the same surgical principles as applied to any structure of the body similarly affected. Cleanliness is all important in the treatment of suppurative disease of the ear. It is mainly owing to the fact that cleansing is not thoroughly and regularly carried out that many cases fail to heal. Besides, the treatment requires to be continued in the more chronic cases over a long period, and patients generally give it up too soon. They either become tired of carrying it out or they become hopeless of cure. On the other hand, they sometimes conclude that the ear is cured, without giving the surgeon an opportunity of examining and giving his opinion, the result being that, in the course of a short time after discontinuing treatment, the suppuration returns as at first. It is difficult to get the patient to comply with instructions as to the treatment of a running ear. It is often necessary for the surgeon to treat the case from beginning to end with his own hands.

On account of *the unfavourable situation of the middle ear*, the matter collects, and lies decomposing, as it cannot flow away properly and be removed, as in the case of an affection of the exposed surface of the body. Free drainage, absolutely essential in the healing of any wound, is not possible in the case of the ear, owing to the position of the tympanic cavity deep down in the temporal bone of the skull. It is, therefore, necessary to remove the purulent accumulation by means of the syringe. Allowing the discharge to accumulate is undoubtedly one of the principal means of perpetuating the disease. But the treatment must be carried out properly in order to be effective. Many patients imagine they can syringe their own ears, but we have only to look at their attempts to do so to see how futile they are. Either the doctor himself should perform the operation, or, if more convenient, a relative or friend should be instructed how to do it. There is a danger of syringing too much or over too long a period. As soon as the discharge begins to moderate it should be done less frequently, otherwise it will, particularly in the hands of attendants, serve to keep up the irritation.

Certain *nostrums and drugs* have been associated with treatment of the ear, the variety of applications being greater than the remedies used for diseases of any other organ of the body. One of the most common applications is oil, especially almond oil, applied warm. The oil is even poured into ears full of fœtid matter, and only promotes decomposition. In no case of ear disease should oils be used. They are not only

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useless, but very injurious, because they become rancid and irritate the outer ear, at the same time providing a soil for the growth of micro-organisms. The application of tepid water is even preferable in the only cases in which oil may be of use—namely, for the purpose of softening accumulations of wax with a view to removal by syringing. Various kinds of soaps have been prescribed for syringing the ear, all being equally injurious. All sorts of essential oils have been used, and poured into the ear without mercy, along with turpentine, naphtha, creasote, laudanum, camphorated oil, cloves, garlic, whisky, brandy, glycerine. Some have advised the insertion of a piece of fat bacon into the ear, and others the application of part of an onion. The application of black sheep's wool is another ugly and uncleanly popular nostrum. There is also *a prejudice in favour of applying cotton wool* in all manner of ear affections. We even find people inserting it into perfectly healthy ears, as a precaution against affection by cold, as if the ear-drum were not sufficiently protected by nature. Plugs of cotton are generally stuffed into suppurating ears, and become saturated with the irritating discharge, as they are not renewed frequently enough. It is better to admit the entrance of fresh air rather than seal up hermetically a foul, decomposing cavity. Even medical practitioners themselves and druggists dispense applications more likely to produce harm than good in the cases of patients suffering from suppurative ear disease. They give what they call "ear-drops," consisting often of oil and some tincture, to be applied indiscriminately in all cases of ear trouble. Such preparations are applied to ears full of purulent matter without any previous examination or cleansing, and only aggravate the filthiness of the condition. Liniments, tincture of iodine, and blisters around the ear are commonly applied in all ear diseases, with the sole result of causing unnecessary pain. Boracic acid, ever since its introduction into medical use, has been identified with the treatment of every ear affection. It is generally prescribed in the form of powder, to be blown into the affected ear, even on the top of accumulations of purulent matter, in which case it cannot possibly effect any benefit.

There is *no panacea for ear disease.* The appropriate treatment can only be indicated by a careful inspection and correct knowledge of the diseased organ, and there can be no justification of random attempts at treatment made entirely in the dark. Medical men have been inclined in the past to minimise the gravity of ear affections, owing to their want of familiarity with the methods of examination and treatment.

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In the case of a child, parents have been advised "to leave the suppuration to nature, and the child will outgrow it," and other subterfuges, equally futile, have been employed in regard to adults. Practitioners have dealt with this class of diseases in a manner that savours of quackery or empiricism, by prescribing advice and nostrums which they would never think of giving for similar forms of disease in any other organ of the body. This unfortunate circumstance has contributed very much to the neglect of ear diseases, and to the production of the large proportion of chronic and incurable cases.

The aspect in which diseases of the organ of hearing have been all along regarded has given wide scope for *quackery*. Patients failed to find relief from legally qualified practitioners, both on account of the ignorance of the profession and also on account of the chronic and incurable character of the disease. It was no wonder, therefore, that such sufferers, despairing and disheartened, threw themselves into the hands of quacks and nostrum-mongers.

At the present time even we are daily confronted in our newspapers and journals with the alluring *advertisements of fraudulent charlatans*. For curing all the various affections of the ear the same drops, powders, lotions, and ear-drums are duly guaranteed. In all cases the treatment is not only similar but identical. It matters not to these designing and unscrupulous impostors how the ear is diseased, or, indeed, whether it is affected or not: their only aim is to extract money from their too credulous dupes, of whom there is always a large proportion among the people of all countries. Fraud is the only object of advertisers who profess to cure patients suffering from ear affections whom they have never seen. From a few symptoms detailed in a schedule sent through the post it is impossible to form an opinion: a careful examination is necessary in each case.

The *incomplete training of medical students*, and the consequent inability of general practitioners to examine and treat the various organs affected by disease, has given rise to *the practice of specialism* in the profession of medicine. But while special practice met the necessities of the public, only the more affluent private patients could avail themselves of it, because the specialists' fees were prohibitive in relation to the industrial classes of the population. Provision has been made at the medical charities for affording free treatment to poor people suffering from special diseases. Indeed, in this respect the indigent poor are more fortunately situated than their neighbours of the artizan or middle class. The poor people

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understand that such medical institutions exist for their particular benefit, and therefore unhesitatingly resort to them. Working people, who can afford ordinary medical charges but cannot spare special fees, must betake themselves to the public medical institutions, and make themselves objects of charity, before they can obtain the desired treatment of their particular ailments. Such people naturally delay for some time before taking that course, while the disease from which they are suffering is rapidly becoming worse, and passing the acute stage when it could readily be cured. This circumstance is responsible in a considerable degree for neglect of diseases of the ear among the middle classes of the population. As the members of the profession become able to deal with special diseases, the number of chronic, incurable, and dangerous cases will diminish. Patients of all classes affected with ear disease are now seeking advice earlier and in greater numbers than formerly. They are overcoming the old prejudices so long associated with this department of disease, and are aware of the fact that the profession is more competent and ready to deal with it. Within recent years aural surgery has advanced mostly in the direction of the treatment and cure of disease extending from chronic suppuration of the ear to the brain, and many lives have been saved that would have been sacrificed in former times.

I may appropriately conclude these general observations on the most common class of diseases of the ear as introductory to the course on aural surgery in this medical school, by giving a short sketch of the history of the teaching of that subject in this city. Systematic lectures on aural surgery were first given in Glasgow by the late Dr. Cassells at the Dispensary for Diseases of the Ear in Buchanan Street. He began to lecture to students and practitioners in the year 1873, and his courses of instruction were so successful that a committee of the most influential citizens was formed, about twenty years ago, for the purpose of raising a sum of money to endow a chair of aural surgery in the University. A considerable amount was subscribed and offered to the University authorities for that specific purpose, but difficulties stood in the way, and the money obtained was transferred to the fund for extending the Ear Dispensary into an Hospital, for the reason that Dr. Cassells was virtually doing the work of teaching aural surgery which had been contemplated by the founding of the University lectureship. It is now sixteen years ago since this aural lectureship in Anderson's College Medical School was inaugurated. Although the teaching of

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aural surgery has not been recognised by the University authorities until the creation of a lectureship this year, it has by no means been neglected in Glasgow.

Opportunities for clinical study of aural surgery in Glasgow have been afforded as far back as the year 1858, when the late Dr. Corbett opened a Dispensary for Diseases of the Ear. The late Dr. D. Patrick practised as the first aurist in Glasgow from the year 1845 till 1865, but he did not start any public institution. Previous to the year 1872, there was a Dispensary for Diseases of the Ear and Skin in John Street. An Ear Dispensary in Montrose Street was conducted by Dr. D. Dewar for about nine years previous to 1875. The Dispensary started by Dr. Cassells in 1872 became the Ear Hospital in 1880. Advice on ear diseases was first given at the Royal Infirmary by Dr. Dewar in 1875. About the year 1877 a department for aural disease was formed at the Western Infirmary. Since then, special cliniques for diseases of the ear have been established at Anderson's College Dispensary (now the Central Dispensary), at the Glasgow Public Dispensary, the Children's Hospital, and at the Tradeston Dispensary of the Victoria Infirmary. According to the new regulation for medical study, necessitating a course of five years instead of four, as formerly, students will have more time to devote to special branches of medicine and surgery, and will therefore acquire a more thorough knowledge of them. The trend of medical education at the present day is towards giving students a complete all-round training, including a practical knowledge of special departments of disease. Although specialists and consulting practitioners will no doubt suffer in consequence, the public health, and the medical profession in general, will reap the benefit.

NOTES OF A CASE OF MISSED LABOUR.[1]

BY ROBERT JARDINE, M.D. EDIN., M.R.C.S. ENG., F.F.P.S. GLASG.

MISSED labour is a condition of sufficient rarity to warrant me in bringing notes of the following case before you.

The patient was 42 years of age, pregnant for the thirteenth time. I had delivered her twice before: the first time, in December, 1890, of her eleventh child, by means of high

[1] Read at a meeting of the Glasgow Obstetrical and Gynæcological Society, 29th May, 1895.

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forceps; the next time, in 1893, of her twelfth child, by version for prolapse of the cord. She had been menstruating profusely every three weeks for some time, until it ceased in the last week of May, 1894. She was quite sure of the date. In August her face, arms, and legs became very much swollen, but this passed off in a short time. She quickened at the usual time, but stated that the movements were never very vigorous. She was very much stouter than she had ever been in former pregnancies. On 1st March, while stooping at the fireside cleaning the grate, the waters suddenly gushed away from her in great quantity, flooding the whole floor. She felt no pain at the time, but felt slight movements. She had irregular pains after that for a day or so.

I was sent for on the 9th, eight days after the waters had come away. The fœtal heart could be faintly heard to the left and below the umbilicus, and she still felt slight movements. By palpation the head could be made out lying above the brim and to the left. *Per vaginam* the os would admit one finger, and the head could just be reached. There were no uterine contractions.

Next day the conditions were unaltered. She promised to send for me as soon as the pains commenced.

I heard nothing more about the case until the 27th, and had concluded that the labour had either ended naturally, or that they had sent to the Maternity Branch, as her former labours had been conducted in connection with it.

At noon of the 27th, I found her having strong pains, and the head of a putrid fœtus presenting at the vulva. She stated that all movements had ceased the day after I had last seen her. She had remained in the same condition until the 23rd, when, as she termed it, she "began to alter," and this had continued. The discharge had been dark and foul-smelling. At 12 P.M. on the 26th the labour pains had begun.

The delivery was easily accomplished, and the placenta came away naturally. The fœtus, a male, apparently full time, was very soft and putrid, and the cord, which was 36 inches long, was quite black. The placenta was somewhat macerated, but did not present any abnormality. I gave an intra-uterine perchloride of mercury douche.

Next day she felt very faint, and was much troubled with flatulence, and had a bad headache, but the temperature was normal and the pulse 98. There was some pain over the uterus. She was poulticed and given quinine. After that she had no further trouble, and was up in about a week.

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Playfair, in his *Midwifery*, says:—"The term *missed labour* is applied to an exceedingly rare class of cases, in which, at full period of pregnancy, labour has either not come on at all, or, having commenced, the pains have subsequently passed off, and the fœtus is retained *in utero* for a considerable length of time. Under such circumstances it has usually happened that the membranes have ruptured at or about the proper time, and the access of air to the fœtus *in utero* has been followed by decomposition."

Was this case one of missed labour? I think it was. If we calculate from the last week in May, we find the labour was due in the beginning of March, or just at the time the membranes ruptured. Under ordinary circumstances the child would have been born at least within a few days. I have seen a week elapse between the rupture of the membranes and the birth of a live child, but never longer.

The causes of missed labour usually given are, according to Lusk, "abnormal absence of uterine irritability or of that residing in the reflex nervous centres, obstructed labour, and unusual close adhesions of the placenta." There was no obstruction to the labour, neither were there any indications of the placenta having been adherent. In a paper read before this Society, and afterwards published in the *British Medical Journal* (7th May, 1892), I gave notes of a case of prolonged gestation with complete occlusion of the os externum. That case might have been classed as one of missed labour due to obstruction, as she had pains at term, and thought the labour was coming on, but she was not delivered for nearly four weeks later—305 days from the cessation of menstruation. Her child, however, lived until the time of delivery, but was too large to be extracted alive. In the present case the "abnormal absence of uterine irritability" seems to me to have been the cause. This was brought about by the uterus having been over-distended and practically paralysed. It must be borne in mind that this was her thirteenth pregnancy, so that over-distension would have a marked effect on her uterus. I did not see the woman before the escape of the waters, but she said she had been very much stouter than with any of her other children; and both she and her neighbours assured me that so much water came away from her that it flooded the whole floor. They estimated that there had been several basinfuls. There is no doubt the quantity had been very great. The loss of the liquor amnii would account for the death of the fœtus, and the admission of air soon rendered it putrid. The labour came on, in all probability, at the time

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when a menstrual period would have occurred had she not been pregnant.

The retention of a dead fœtus *in utero* up to term is not very uncommon, especially in twin pregnancies. I have seen four such cases, where one child was born at full time alive while its fellow-twin had been dead for several months. In one of my West End Branch reports I have given notes of a case where a dead fifth month fœtus was born at term. The membranes had remained intact in all of these cases.

A good many cases of missed labour have been recorded, in some of which the fœtus had been retained *in utero* for many years. We are all familiar with the famous case of Dr. Cheston, in which the period of retention is stated to have been fifty-two years. Bland Sutton quotes this as an instance of a retained extra-uterine gestation, which it evidently was, so that it was not really a true case of missed labour. Müller, of Nancy, tried to prove that most of the recorded cases were really cases of extra-uterine gestation. The late Dr. Angus Macdonald, in a very interesting paper read before the Edinburgh Obstetrical Society, describing a case in which he removed one horn of a bicornuate uterus containing a fœtus which had been retained a year, maintained that these cases of missed labour were really cases of conception in one horn of a bicornuate uterus where there was an obstruction to the passage of the child, either from the canal of the cervix being too narrow or occluded. A few cases similar to his have been published.

There is no doubt that some of the recorded cases have really been extra-uterine gestations, while others have been similar to Macdonald's, but still some of them have been true instances of retention of the fœtus in the uterine cavity. In mine it certainly was, but, as it was only retained twenty-seven days, one almost hesitates to call it a case of missed labour.

When a decomposing fœtus is retained *in utero*, the condition is a very serious one for the woman. She is exposed to the dangers of septic poisoning, and also of ulceration of the uterine wall. Sir James Simpson recorded a case where an opening formed into the transverse colon and caused the death of the patient three months after term. If one is definitely sure that the woman has gone beyond the term, and that the fœtus is dead, the uterus should be emptied. This must be done with great care, as the walls may be thinned out very much. In my case, if the woman had sent for me when the discharge began, I would have dilated at once and have

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removed the fœtus, but fortunately Nature accomplished this unaided.

The sooner the uterus is emptied, the better chance there is of saving the woman. If the fœtus is very much decomposed —coming away in bits, as in the cases recorded by M'Lintock and others—Porro's operation would give the woman the best chance. Macdonald strongly advocated this operation, on the supposition that all the cases were conceptions in one horn of a bicornuate uterus.

ON SECONDARY PAROTITIS, WITH NOTES OF FOUR CASES.

BY C. O. HAWTHORNE, M.B., F.F.P.S.G.,

Assistant-Physician to the Glasgow Western Infirmary; Clinical Assistant to the Professor of Medicine in the University of Glasgow; Lecturer on Materia Medica and Therapeutics, Queen Margaret College, University of Glasgow.

PAROTITIS, apart from mumps, has been described as an incident in association with a considerable number of pathological conditions; and the exact relationship of these conditions to inflammation of the parotid has given rise to some diversity of opinion. One group of the cases in which a secondary parotitis has been observed is affections of the generative organs. Thus, injury of the testicle[1] has been followed by parotitis, and Trousseau[2] records a case of suppressed menstruation in which, at each monthly period, an inflammatory condition of one or other parotid region occurred. Other cases, too, have been observed in which functional disturbance of the salivary glands has coincided with the occurrence of menstruation;[3] and in one case, described by Stephen Paget,[4] swelling of the parotids appeared in successive pregnancies, and was the first subjective indication of that condition. Even the introduction of a pessary into the vagina[4] has been followed by parotitis. The development of inflammation of the parotid gland under such circumstances as those just mentioned has been regarded as the converse of what sometimes happens in mumps. Orchitis is, of course, a recognised complication of that disease, and in the same disorder female patients are liable, though less frequently, to the development of inflammatory

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complications in the breasts[5] or, more doubtfully, in the ovaries.[6]

Further, it is to be noted that, in the experience of some surgeons, parotitis is specially likely to occur after operations on the female generative organs,[7] and this, too, without any indication of general pyæmia. In reference to the cause of this association between inflammatory and other disturbances of the generative organs and parotitis, various suggestions have been made. Mr. Hutchinson[8] finds an explanation difficult, "unless it be that the parotid gland and testis, when inflamed, develop elements which are mutually infective." Bumm,[9] who believes there is a special relationship between ovariotomy and parotitis, suggests that, as a result of nerve irritation following the operation, the secretion of saliva is suspended by reflex influences, and micro-organisms then enter the parotid gland through Stenson's duct.

A possible further illustration of the pathological relationships of the generative organs and the parotid gland is afforded by the occasional occurrence of orchitis[10] and (though in still more rare instances) of parotitis[11] as a result of gout.

Parotitis is also a recognised though uncommon complication of some of the specific fevers. Murchison[12] found it most frequently in typhus, and regarded its occurrence in this disease as establishing a connecting link between typhus and oriental plague. He also recognised it in relapsing fever and in enteric fever; and in the experience of other authorities it appears to have been most frequently observed in the last-mentioned. Gee[13] regards the inflammation of the parotid in these cases as the result of dryness of the mouth, the irritation extending from the buccal mucous membrane along Stenson's duct to the substance of the gland. This view has been supported by other observers, and it has been maintained that, from the very earliest appearance of the symptoms of parotitis, pressure over the duct of the parotid will cause the expulsion of a drop of pus from the orifice.[14] As the result of histological examination of the duct and gland in several fatal cases, Hanau[15] came to a similar conclusion. It is interesting, in this connection, to note the occurrence of recurring attacks of parotitis, or at least of swelling of the parotids, in cases of xerostomia or dry mouth. Several examples of this association have been described,[16] and Mr. Hutchinson, who has recorded a number of such cases, regards the two conditions as resulting from some nervous disturbance. In the majority of the cases of this character the xerostomia has been a very chronic condition, and has developed without apparent cause; but

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Hutchinson[17] also reports two cases in which dryness of the mouth, with painful swelling of the parotids, appeared on the third day after an injury (which subsequently proved fatal) to the abdomen. In each case the swelling disappeared in the course of a few days without suppuration. It is very difficult, under these circumstances, to regard the parotitis as pyæmic in character; and further, as there was in each of the patients, as an immediate result of the accident, copious sweating, followed by dryness of the skin as well as of the buccal mucous membrane, and the passage of an excessive quantity of urine, it seems a fair inference that the violence to the abdomen produced reflexly through the nervous system disturbance of the function of various glands, including the salivary glands. It is, of course, still open to argument that the parotitis was not a direct but an indirect result of this disturbance, the cessation of the salivary secretion giving an opportunity to germs or other irritants to reach the gland through the unoccupied Stenson's duct, or in some other way rendering the gland susceptible to the influence of septic agents.

The relation of parotitis to pelvic and abdominal lesions has received considerable attention from Stephen Paget, who has come to the conclusion that cases of parotitis associated with such lesions form a group by themselves. Paget questions the pyæmic origin of the inflammation. He has collected 101 cases[18] of parotitis following abnormal conditions in the pelvis or abdomen, and points out that in the great majority of these the parotitis, as an inflammatory event, was an isolated one; that in a considerable number of the cases there was no suppuration; that the attack was, as a rule, unattended by rigors or by any decided rise of temperature; and that the issue of the case was in no practical sense prejudiced by the parotitis. These facts he considers conclusive against the suggestion that the inflammation of the parotid was due to any "ordinary form" of pyæmia. Paget also rejects the suggestion that the inflammation travels from the buccal cavity backwards along the parotid duct, and instances, in support of this view, the fact that it is quite exceptional in these cases to find the *socia parotidis* specially affected, or attacked at an earlier date than the main body of the gland. The view that Paget advocates is that there is some special connection, through the nervous system, between the abdominal and pelvic viscera and the salivary glands, and that lesions of the viscera lead reflexly to a congestion of the gland which may proceed to inflammation, and even to suppuration. And

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in support of his position, he refers to the recognised influence which morbid conditions of the stomach exercise upon salivary secretion; to the experiments (upon dogs) in which inhibition of the secretion of saliva is produced when a coil of intestine is withdrawn from the abdomen, the secretion returning when the intestine is replaced; and to the occasional occurrence of salivation during pregnancy.

Besides Paget's cases, other examples of the occurrence of parotitis in connection with abdominal and pelvic lesions have been put on record. Christopher Martin,[19] after an experience including a thousand cases of abdominal section, speaks of it as a "curious complication," which "usually occurs during the second or third week, and may nearly always be traced to a septic cause." It may be noted, however, that other surgeons have observed the development of parotitis at a much earlier date. Thus, in Mr. Jalland's case, already alluded to, the parotid swelling appeared on the third day after operation. Fagge[20] describes parotitis in a case of intestinal obstruction due to cancer of the sigmoid flexure; Taylor[21] observed it following an operation for imperforate anus; H. C. Cameron[22] after abdominal section; Middleton[23] in a case of fæcal tumour, and as a complication in pernicious anæmia[24]; Grisolle,[25] from experience in the Vienna Hospital, notes it as occurring on five occasions in a total of upwards of 5,000 cases of pneumonia; Gowers[26] describes parotitis as an event in a fatal case of peripheral neuritis following a stab wound under the left clavicle, the wound "healing well;" Fagge mentions it as an occasional complication of influenza[27] and of yellow fever[28]; two cases have been noted in which parotitis complicated an attack of illness regarded as of the nature of acute rheumatism[29]; and Gee[13] records the occurrence of parotitis in a fatal case of chorea accompanied by a very dry state of the mouth and tongue.

The four cases briefly recorded below have all come under my observation in hospital practice. The first was regarded, without much doubt, as a case of gastric ulcer, though the rapidity of the convalescence may possibly introduce a question as to the accuracy of the diagnosis. In the second case, the slight development of gastric symptoms other than the hæmatemesis, and the prompt improvement of the patient leave it an open question whether the case is to be marked as one of "latent" gastric ulcer, or as belonging to the group described by Trousseau and others, in which hæmatemesis occurs without any ulceration of the gastric mucous membrane.

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In neither of these patients was there any fact, either in the history or the physical diagnosis, to suggest cirrhosis of the liver or other cause of portal obstruction. The occurrence of parotitis in cases of gastric ulcer and hæmatemesis must, I think, be a most unusual event. In Mr. Paget's[18] list of 101 cases of secondary parotitis, 18 are classified as following disease or injury of the alimentary canal, and in only one of these was there any question of the existence of a gastric ulcer. Even in this one the diagnosis was doubtful, and as the patient was at the time suffering from "two small bed-sores," it by no means follows that the parotitis was consequent upon the gastric ulceration, allowing that this was actually present.

The third case illustrates the occurrence of parotitis in lobar pneumonia; it provides an exception to the experience of Grisolle,[25] who found this complication a serious one, as in his cases the inflammation usually terminated in suppuration or gangrene. In the fourth case the parotitis may fairly be regarded as following the appearance of purulent matter in the peritoneal cavity.

CASE I.—Jean J., æt. 42, unmarried. The history gives a record of epigastric pain, with almost constant vomiting, of three weeks' duration, and, on the morning of admission to the hospital, the occurrence of a free hæmatemesis. Previous health good, except for mild attacks of gastric disturbance at intervals during the last three years. Under rest in bed, the use of bismuth subnitrate, and the absence of solid food, the stomach symptoms soon subsided, but a fortnight after admission pain was complained of under the right ear; the right parotid region rapidly became swollen and extremely tender, the temperature rising to 101° F. In the course of forty-eight hours, however, the temperature fell to normal, and the swelling gradually disappeared without suppuration.

CASE II.—Janet L., æt. 26, unmarried, admitted to the Infirmary on account of a severe hæmatemesis extending over twenty hours. The hæmatemesis was repeated three days after admission, and was followed by melæna. Four days after the second hæmorrhage, evidences of right parotitis appeared, the temperature running up to 101·8° F. Under treatment, the local condition improved and fever subsided, but after a few days' interval pain and swelling returned, and the temperature reached 102·2° F. Fluctuation could now be detected, and a large quantity of pus was evacuated on incision.

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The patient had always enjoyed good health, but had been apt to vomit her food from childhood. For a week before the hæmorrhage she had experienced some pain after food, but this had not been severe, and there had not been at this time any vomiting. Physical examination negative, except for undue pulsation in the abdominal aorta. After relief of the parotitis by incision, gastric symptoms ceased to be apparent, and patient made a rapid recovery.

CASE III.—Mary I., æt. 17, admitted with pneumonia of left lower lobe; crisis distinct on ninth day. During the next ten days patient remained well, except for a slight rise of temperature which soon passed away and for which no explanation could be found. At the end of this time she complained of pain at the left angle of the jaw and headache, and the temperature rose to 103·6° F.; no rigors; fulness and tenderness were detected over the left parotid gland. In the course of three days the temperature fell to normal, and all the symptoms had disappeared; subsequent convalescence uninterrupted.

CASE IV.—Thomas B., æt. 46. This patient was the subject of aortic disease, with amyloid changes in the viscera, and evidences of syphilis in the liver. In the latter part of his illness ascites became troublesome, and six days before death the abdomen was tapped. Two days after this both parotid glands became much swollen and very painful, and remained so until death. *Post-mortem* examination revealed the changes mentioned above, also the presence of fluid with soft yellowish fibrinous exudation in the peritoneum, and pus infiltrated through each parotid gland.

It cannot be claimed that these cases contribute any very definite support to any of the various theories suggested to explain secondary parotitis. But it may be observed that, in each one of them, opportunity existed for the entrance of septic matter into the blood, and it is, therefore, at least possible that, under certain circumstances, the parotid gland may discharge an excretory as distinct from a secretory function, and that, in the act of excreting septic or other materials, it may be "irritated" into a state of inflammation or even suppuration. That the secretion of saliva may be influenced reflexly through the nervous system there can be no doubt, but it is difficult to believe that an inflammatory swelling or suppuration can be explained in this way. And it

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may be fairly questioned whether the swelling of the parotid gland that is known to occur at intervals in cases of chronic xerostomia, and other conditions, is of the same nature as the parotid inflammations that follow lesions in various parts of the body. If secondary parotitis were due to the passage of irritants from the buccal cavity into Stenson's duct, one would certainly look for its more frequent occurrence, considering the large number of cases in which, with febrile phenomena, there is extreme dryness of the buccal mucous membrane.

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NOTE ON TWO CASES OF PAROTITIS AS A COMPLICATION OF INFLUENZA AND PNEUMONIA.

BY JOHN H. CARSLAW, M.D.,
Assistant to the Professor of Practice of Medicine, Glasgow University.

WHATEVER view may be taken as to the importance of the micro-organisms described in connection with acute croupous pneumonia and with influenza, it will be admitted that the clinical study of those diseases warrants the recognition of a very distinct relationship between them and the great specific fevers. That relationship is illustrated, for example, by their sharing the liability to certain definite complications and sequelæ. The case for pneumonia, in this respect, was strongly stated in Dr. Hector Cameron's Presidential address to the Glasgow Medico-Chirurgical Society, "On a Surgeon's Experience of Diphtheria, Enteric Fever, Scarlet Fever, and Pneumonia."[1]

One of the rarer complications of pneumonia is parotitis. Jürgensen, in *v. Ziemssen's Cyclopædia*,[2] quotes statistics showing the small percentage of cases in which it occurs (about one-tenth per cent). In two cases, which it is desired now to put on record, the parotitis followed closely upon an attack of acute pneumonia, typical in regard to sputa, physical signs, duration of pyrexia, and other phenomena. This attack of pneumonia, however, seemed in each case to develop as a complication of influenza. On reference to Althaus's monograph,[3] I find quotations, from two authorities, of cases of inflammation of the parotid as a sequela of influenza. Zülzer, in *v. Ziemssen's Cyclopædia*,[4] says that (in influenza) "parotitis with salivation is sometimes observed." It is thus quite natural to suppose that not only the pneumonia, but also the parotitis, in the present cases, may be regarded as a complication or sequela of the influenzal attack, just as both might occur as complications or sequelæ of enteric fever. In the second case it will be noted that there was the further complication of a severe intestinal catarrh. That is not unknown in pneumonia, but it is at least as common in

[1] *Cf. Glasgow Medical Journal*, 1894, vol. i, p. 376.
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[3] *Influenza: its Pathology, Symptoms, Complications, and Sequels*, &c., 1892, pp. 266, 267.
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influenza without chest complication. Both patients were beyond middle life; Jürgensen[1] says that Grisolle speaks of the patients (in pneumonia) most apt to be attacked by parotitis as those "beyond sixty years of age," while one of Althaus's references[2] is to the report in the *British Medical Journal* (11th July, 1891) of parotitis after influenza "in three old women."

The following are the essential points in the histories of the cases referred to, both of which occurred in private practice:—

CASE I.—Miss A., aged about 50 years, had been attended previously for minor rheumatic attacks, and was seen, on 24th January of this year, on account of bronchitis, râles being most abundant in the left base. The temperature was normal at that date, and patient seemed for some days to be improving, though she had not yet been allowed to rise from bed, when, on the evening of the 27th, she shivered, and was attacked by severe pains in the head and throughout the body. Next morning her temperature was found to be 103·5°; that evening (28th) it was only 100°; but an antipyretic which had been prescribed probably accounted, in great part, for this fall. On the 29th complaint was made of pain to the left of the cardiac region, respiration was hurried, there was "rusty" expectoration, and temperature had again risen to 102°. Abundant muco-crepitant râles were heard in the left base, but no friction-sound could be detected, and no tubularity of respiratory murmur or dulness to percussion. Signs of consolidation in the left base had, however, developed by the following day (30th), temperature had risen to 104°, and patient was delirious. The further progress of the case did not differ from that of a typical attack of acute pneumonia, a favourable crisis occurring on 3rd February. On that date there was complaint of pain and swelling in the right parotid region. The swelling continued to increase until 9th February, but there was no return of serious pyrexia. The part was poulticed, a piece of lint soaked in oil being interposed to protect the skin. After the 9th February a gradual subsidence of the swelling took place without suppuration, and patient's convalescence otherwise, though by no means rapid, was perfectly satisfactory.

CASE II.—Miss B., aged 60, had also had rheumatic attacks, but was in good health when suddenly taken ill on 4th March with pains all over the body. Nothing abnormal was at that

[1] *Loc. cit.* [2] *Loc. cit.*

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time detected on physical examination of the chest, but the temperature was 101°. On the 5th it was 99·4°; on the 6th, 99·2°; and on the 7th it was perfectly normal, and the chest was still free from any sign of disease. On the 9th a few muco-crepitant râles were detected in the right base, but there was no sign of consolidation, and the temperature had not risen. Examination of the chest on the 11th gave indications of improvement; temperature was normal, and patient's chief complaint was of distressing perspirations. On 22nd March the chest was found free from râle, but patient was still debilitated; on the 26th the respiratory murmur at the right base is noted as weak, and accompanied by slight dry râle.

It is to be noted that patient had all along been confined to her bedroom, and had, indeed, been constantly in bed until 18th March, while any short time after that date that she did sit up she was well wrapped up, and resting on an easy chair by the fireside. A renewal of severe pains took place on 28th March, temperature rising to 101·2°, and muco-crepitant râles being again audible in the right base. On the following day the temperature was 103°; pulse, 104; respiration, 24, and expectoration "rusty." The ordinary signs of consolidation became readily detectable over the right base, and patient passed through an attack of acute pneumonia, defervescence being somewhat gradual, but normal temperature being reached on 3rd April. From 31st March, onwards, diarrhœa proved a most distressing complication; it was temporarily checked on 6th April, but afterwards returned and continued till 16th April; at times it was so exhausting as to threaten collapse.

On 9th April painful swelling began in the region of the left parotid, and the temperature rose from normal (A.M.) to 100·6° (P.M.) Next day temperature was 101°, and the swelling had increased so as to reach from the malar prominence to the posterior border of the sterno-mastoid muscle. Poultices were applied as in the first case. On the 11th some reduction of swelling was noticed, and although it seemed at one time inevitable that suppuration should take place, this fear ultimately proved to be erroneous. Patient's convalescence has been delayed by her extreme debility, but it seems now (22nd June) to be fairly established.

Attention may be drawn to the fact that, in each of those cases, a preceding bronchitis had specially attacked the lobe afterwards the seat of the croupous pneumonia.

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As regards the parotitis, it is interesting to note that in both cases there was subsidence without suppuration, suggesting that the prognosis, in such circumstances, need not necessarily be so unfavourable as might be gathered from the statements of the authorities quoted above. The extent to which suppuration and sloughing may take place in parotitis was illustrated in a case of enteric fever under my care in Belvidere Hospital in 1889. There was no chest complication, but a parotid bubo first attracted attention on 27th June, at which date the patient, a lad of 18 years, was in his fourth or fifth week of illness, and the initial pyrexia had not yet subsided. Several incisions had to be made—the first on 2nd July, the last on 31st July—and it was only on 5th August that it could be noted that the cheek was doing well. On 21st July and succeeding days there was some discharge of pus by the duct into the mouth.

CASE OF A DOCTOR AFFECTED WITH DIPHTHERIA, WHEREIN BEHRING'S ANTITOXIN WAS EMPLOYED.

By JAS. WILLIAM WHITE, M.B.

THE early symptoms of illness in the case of Dr. F. were apparent on the morning of 20th March. Pain in the right tonsil, with difficulty in swallowing, headache and lassitude, were present, with a decided feeling of chill. When patient was seen later in the day the symptoms were intensified, and prostration was greater. The increase of throat pain called attention to a patch, fully a quarter of an inch in diameter, in centre of the right tonsil, while a soft pulse of 100 per minute, and a temperature of 101° F., raised suspicion as to nature of the case. At this point treatment was begun, which was continued throughout, and must be a factor in forming an estimate of the case. Perchloride of mercury in solutions of one-fourth to one-sixth per cent strength was regularly applied to pharynx, and large doses of tincture of the muriate of iron with strychnine, and at times chlorate of potash were employed inwardly. Strong soups, &c., and alcoholic stimulants were freely administered.

On the 21st the severity of the symptoms was greater,

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while, as the list of temperatures indicates, the thermometer registered 102·2° F., with pulse of 104. The pain in swallowing was more marked, and submaxillary glands were considerably enlarged. There was slight albuminuria. On examining the throat, the right tonsil, and part of the anterior pillar of fauces, showed an ashy-grey colour. There was a new formation, translucent, and pearly, evidently in the substance of the mucous membrane, the edges being ill-defined, though generally the lower level corresponded with the lower boundary of the tonsil. The uvula was œdematous and elongated.

The posterior pharyngeal wall and the left tonsil were of bright red colour, but free from new formation. Lower down the surface of the epiglottis was highly injected, while the upper rim of the larynx exhibited marked reddening There was no disturbance of voice. At this point two separate pieces of membrane were removed for examination. An immediate cover-glass preparation of one stained with methyl-blue (alkaline solution) revealed Lœffler's bacillus and various cocci. The other patch was cultivated and gave characteristic growths, from which a cover was prepared, and the diagnosis confirmed.

At 6·30 P.M. on this day, 5 c.c. Behring's antitoxin were injected into the interscapular space by Dr. Newman. Following this dose were a marked crisis in temperature (*vide* list), an improvement in tone of pulse which fell gradually in rate, and a general amelioration of symptoms. A cantering action of the heart was observed for a few hours. No cutaneous eruption occurred.

On the morning of 22nd March the temperature was subnormal, while pulse was of good quality at 80. Throat symptoms continued. It was noticed that the membrane had extended slightly over the anterior pillar. It had assumed a dull white appearance, and looked more prominently on the surface. The edge was well defined, and showed a tendency to detach itself; while, later on, it curled inwards, so that a probe could be inserted beneath without causing hæmorrhage. The central part had suffered molecular loss, and was thus thinner. Elsewhere, congestions were reduced. Mucus adhered to the pharyngeal wall at various points.

At 1·30 P.M. Dr. Newman made a further injection of 2½ c.c. This was followed by a trifling rise in temperature, but afterwards the records were mostly subnormal. The pulse became slow and full, and so continued to the end of the case. Throat symptoms improved rapidly. Glandular

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enlargement lessened, while the membrane, which had ceased to extend, became detached all round the edge. It was discharged in masses from the anterior border backwards, and from below upwards, ultimately leaving a linear patch on the upper part of tonsil. This, too, disappeared in thirty-six hours. From this point nothing need be recorded. The throat resumed its normal aspect. Albuminuria was found to have gone, and recovery was rapid and complete.

In regard to the feeling produced by the exhibition of antitoxin, Dr. F. himself writes:—

"The injection of such a comparatively small dose as 5 c.c. caused considerable local uneasiness for about twelve hours." . . . "Temperature before the injection was 102·2° F., a few hours after it was 99·4° F. The degree of comfort felt was commensurate with this drop; a feeling of comparative ease being substituted for one of intense malaise, headache, nausea, and all the accompaniments of febrile disturbance disappearing."

LIST OF TEMPERATURES, &c.

		Temperatures.		Pulse.	
		A.M.	P.M.	A.M.	P.M.
March 20,	. .	...	101°	...	100
„ 21,	. .	102·2°	...	104	...
„ 21,	6·30 P.M. Injection of 5 c.c. of Behring's Antitoxin.				
„ 21,	. .	...	99·4°	...	108
„ 22,	. .	1. 98·8°	...	1. 85	...
„ 22,	. .	4. 97·6°	...	4. 83	...
„ 22,	. .	7. 97·6°	...	7. 80	...
„ 22,	. .	10. 98·2°	...	10. 80	...
„ 22,	. .	...	1. 98·6°	...	1. 80
„ 22,	1·30 P.M. 2½ c.c. antitoxin injected.				
„ 22,	. .	...	5. 99·0°	...	5. 78
„ 22,	. .	...	8. 98·6°	...	8. 80
„ 22,	. .	...	11. 98·8°	...	11. 76
„ 22,	P.M. Slight albuminuria.				
„ 25,	No albuminuria.				
	Temperature and pulse have continued normal or subnormal.				

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POPULAR THERAPEUTICS AT THE BEGINNING OF THE EIGHTEENTH CENTURY.

BY DUGALD MITCHELL, M.D.

IN the year 1731 there was published at Edinburgh, the third edition of a medical work for popular use, entitled, *The Poor Man's Physician, or the Receits of the famous John Moncreif of Tippermalloch.* Sir John, who was an eminent physician in his day, died in 1710. Who the editor of this third edition was does not appear, but that he was a thorough believer in the efficacy of the "Receits" is very evident, and in concluding his preface, he adds his "hearty prayers that the great Preserver of the Bodies and Souls of men may bless them with success to all those who may have occasion to use them." A point that strikes one very forcibly in looking over such a book as this is the multitude of remedies that are indicated for all diseases dealt with. The more obscure the disease, and the more difficult of cure, the more numerous and varied of course were the cures suggested. Fifteen, twenty, or more different and independent suggestions for the treatment of a single disease are quite common, and when one considers the multitudes of remedies that were had recourse to, drawn, as in earlier days, largely from the animal world, and many of them of the most disagreeable nature, he realises how much reason he has to rejoice in the advances made in pharmacy, more particularly within the present century. Such substances as the following were still popularly recommended:—Bile, urine, the ordure of all sorts of animals, putrefied serpents, menstrual fluid, dried placenta, snails, foxes' brains, the ashes of bones (human and others), dried toads, etc. The blood of hares, goats, bats, bulls, geese, lambs, black sheep, doves, chickens, etc., each and all had their several and specific spheres of action. Such recommendations were, of course, but a lingering legacy from the ancient physicians. Brown-Sequard's suggestion for the invigoration of the aged would not have struck Pliny as at all out of the way, and it is just possible that if we could but follow the reasoning of these old world physicians in their prescribing of such substances, we might not think them so inappropriate as we are inclined to. "Boyle, the great philosopher, esteemed human urine so highly as a medicine that he declared that a full account of its virtues would fill a volume," and urine has been compared lately by Dr. Neale with beef-tea and Liebig's extract, both of them, it

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is contended, consisting mainly of excrementitious materials. What with the modern use of thyroids, thyroid extracts, pancreatic extracts, nerve extracts, brain extracts, spleen extracts, pepsines, and other animal substances, we seem in the fair way to a recrudescence of the materia medica of old, though served up in a more enticing form.

At the beginning of the last century, and for one purpose or other, human milk, cows' milk, mares' milk, sheep's milk, goats' milk, dogs' milk, sows' milk—all were used, and under the most diverse circumstances. The value of milk in phthisis was thus quaintly extolled—"Milk doth hit all intentions for cure. It cleanseth with its serous part; it conglutinateth with its coagulating part; and nourisheth and refresheth with its unctuous part."

Milk from a *black* or *red* cow was specially recommended in diarrhœa, and it was somewhat elaborately fitted for its purpose by being boiled nine times, a little spring water being added after each boiling.

Precious stones continued to be recognised, as in many other countries, as sovereign remedies in innumerable diseases. A jasper, hung about the neck or applied to the liver, was resorted to in spitting of blood. An emerald, held in the mouth, was employed in dysentery, and a "green jasper," we are told, "or a piece of ivory borne about the pit of the stomache stayeth vomiting." A sapphire, held before a boil, was credited with arresting it, and a sapphire, or jacynth, or jasper, or diamond worn or carried, was considered effectual in restoring a lost appetite. To combat the plague even a larger variety might be resorted to—a carbuncle, ruby, agate, garnet, jacynth, or sapphire.

What it is desirable, however, to gather from such a volume as this is, not so much curiosities of practice, as an indication of the relationship which exists between the popular practice of say 160 years ago and the orthodox practice of the present, and to what extent the methods of these former days may be considered the prototypes of those in vogue now. Take, for example, the different ways resorted to for the application of heat for the relief of conditions in which we still employ it. A substitute for a bath in convulsions was the following:—"Put the part affected into an ox or sheep's belly, or other great creature's belly newly killed, and let it remain there till warm." For headache we have this recommendation:—"Sheep's lungs applied hot do much assuage the pain of the head in a continual fever." A live duck's belly applied to the painful part was had recourse to in colic. In sciatica a hot

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gigot of mutton was said to be a most effectual application. Hares' blood applied hot to gouty feet was extolled as a remedy that perfectly cureth the gout, and hot bread from the oven, dipped in fresh butter, vinegar, or spices constituted a common form of poultice in painful conditions such as pleurisy.

Again, take hæmorrhages in their several varieties. The forerunner of tannic and gallic acids may be found in the use made of the distilled water of oak tree leaves in hæmoptysis; or in hæmorrhage from the bowels—water in which the inner rind of an oak sapling had been macerated and boiled. In the advice given to "rub and bind the extreme parts" for the arrest of certain bleedings, it is probable we have the same treatment recommended that is still resorted to in severe hæmorrhages—viz., ligature of the limbs. Recently I have seen an old woman applying a piece of worsted round the little finger of a patient in order to stay epistaxis! May we not find in this a very literal following of the above instruction to bind the extreme parts, but without knowing its origin or the reason why? A very radical remedy for the same condition, yet one quite in keeping with recognised principles, was to "apply cloths wet with vinegar and water to the whole body till the patient trembles."

A method of coagulating the blood locally, which makes us think of the modern use of horse hair in the treatment of aneurism, was the putting into the nostrils of the hairs of a hare mixed with white of egg or vinegar. In menorrhagia, astringent injections such as the juice of strawberries and their leaves, or of plantain was had recourse to, and this application was reinforced by the use of "pessaries of the leaves of purslain, plantain, or knot-grass, or some other convenient herb, bruised and rolled in a piece of fine linen put up in the womb." In the same condition, and in order to produce derivative or revulsive effects, it was advised to "fasten a very large cupping glass to her dugs, but take it quickly off again." Uterine prolapse was treated by reduction, followed by injections of the decoction of galls, or, in bad cases, by the use of pessaries "made of cork, smeared over with wax, or made of wax alone, round or long." A method of reduction spoken of was, to say the least of it, decidedly primitive. It was to "affright the patient with a red hot iron in your hands, threatening to burn the part."

The chief value of a plaster made of clay and vinegar, to be applied to the breasts in galactorrhœa, would probably be found in the support afforded. Another application, which was said to "suffer them not to grow great," was made up of

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honey, wax, and doves' dung, and this also, whatever else it did, would afford the necessary support. This supporting method of treatment was practised also in parotitis, in which a plaster composed of glue, resin, and wax in equal proportions was recommended.

Fissured nipples were dressed with an ointment composed of the inner bark of the elder tree, grease, and wax—a composition that may have acted as a good substitute for tannic acid and spermaceti, being on the same lines. The remedy that was most highly esteemed in the treatment of suppurating ears was the juice of the leaves of the willow—a substance which, in all probability, was, though unrecognised, effective, from its antiseptic properties. Modern antiseptics in chest diseases we may consider forestalled by the giving of tar in pneumonia; pitch, made up with honey, in "short-windedness;" venice turpentine in empyema; and turpentine in various other lung affections.

With regard to the treatment of dysentery, we can see a seeking after astringents in the use made of "iron water," "steeled milk," the juice of ground ivy, &c.; while the value of protective substances we may find recognised in the recommendation to "roast a young pigeon stuffed with wax, and give it to the patient." For the relief of pain and tenesmus, an emollient application in the form of a suppository of goats' suet was prescribed.

When a pin was swallowed, the patient was instructed to sup fat broths and eat much butter. In similar conditions we might with advantage follow the same lines, and secure a helpful lubricating effect by giving considerable quantities of olive oil.

"If it [iliac passion] come of the circumvolution of the intestines, which is either from wind or a hernia, the last remedy is to apply a smith's bellows to the anus, and blow in the belly." The idea is as old as Hippocrates, and like treatment has been not unfrequently tried in our own days, though carried out after a more refined fashion.

Eye diseases, as was to be expected, claimed a host of remedies. A soothing application was found in pigeons' blood, which was to be dropped in frequently. "If clouds appear in them, they must be scoured off with sugar-candy finely powdered." Probably the cure in such a case would not be due to "scouring," but to the stimulation facilitating absorption. It is also noted that "a drop of the patient's urine powerfully drieth up tears"—a primitive wash which

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is still employed for this purpose in some parts of the country.

The stimulating method of treating alopecia was effected by rubbing the head over with onions, or by using the burnt ashes of goats' hoofs rubbed up with pitch. Pitch, when combined with sulphur, was also used as an external application in pleurisy; while in rheumatism a substitute for the blister or other counter-irritant was found in the vigorous application of nettles. Ashes of burnt egg-shells were had recourse to for absorbent purposes.

In ulceration of the nostrils a primitive carbonaceous application was obtained by snuffing up the smoke from wax candles, which was said to "powerfully dry up the ulcers."

A local application resorted to in erysipelas and burns was raw eggs, and, on the principle of excluding the air, they would probably constitute an effective dressing. Blood was also recommended in the treatment of burns, and, on the principle of protection, we can imagine it to be effective though gruesome. For the purpose of "drying up" burns, the ashes of burnt bark were sprinkled upon the raw moist surface.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING VIII.—15TH MARCH, 1895.

DR. CHARLES WORKMAN, *Vice-President, in the Chair.*

DISCUSSION ON DIPHTHERIA, LIMITED TO THE ETIOLOGY, DIAGNOSIS, AND PROGNOSIS OF THAT DISEASE AND ITS TREATMENT BY SERUM.

DR. R. M. BUCHANAN.

FROM the time of Bretonneau's description of diphtheria in 1826, the pellicular membrane has been regarded as the most constant and characteristic feature of the disease, and the one held to be essential to its identification. When we consider, however, that membrane is simply a fibrinous

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exudate, which may result in a number of inflammatory processes besides diphtheria, its untrustworthiness as a means of diagnosis becomes apparent. Thus, whilst a large number of cases of diphtheria declare their true nature by the presence of an unmistakable exudate, there are others in which it is so equivocal that the clinician is unable to decide whether the disease is to be ranked as diphtheria or as a simple inflammation. Again, diphtheria is frequently met with in cases in which the exudate does not appear as a membrane, but in the guise of a follicular tonsillitis; and, further, cases are occasionally seen in which the local manifestations are confined to redness and swelling. From the point of view of clinical experience, therefore, the differentiation of diphtheria from other affections is frequently beset with great difficulty, and has become involved in much confusion.

Happily bacteriology has thrown a flood of light on the whole subject. The discovery of the specific contagium of diphtheria, the Klebs-Loeffler bacillus, has afforded a test by which the disease may be differentiated from other membranous affections. It has also led to a truer conception of the whole morbid process, and gone far already towards placing the prophylaxis and treatment of the disease on a rational basis.

The detection of this bacillus, therefore, becomes a most essential factor in diagnosis, and I have the honour, in opening this discussion, to direct attention especially to the methods employed for this purpose, and at the same time to bring facts elicited by bacteriological study into relation to the symptomatology and pathology of the disease. The inquiry presents itself naturally in three divisions, in accordance with the postulates formulated by Koch for the recognition of a microbe as the specific cause of a disease—namely, (1) the microscopical examination of the fibrinous exudate for the bacillus of diphtheria; (2) the cultivation of the bacillus on artificial media; and (3) the production of the disease by inoculation of a pure culture in a healthy animal.

Microscopical Examination.

The formation of the membrane in diphtheria is preceded by the colonisation of this microbe on the mucous surface. This takes place, in by far the largest number of cases, in the pharynx, and the sites next in order of frequency are the nose, the larynx and trachea. The comparatively frequent

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implication of the pharynx is probably dependent on the readiness with which the tonsils may arrest the virus in transit backwards by means of inspired air or saliva, on the fitting nidus offered by the tonsillar crypts for its undisturbed growth, and on the fact that the surface is so often in such an unhealthy condition as to offer a very suitable soil.

A small portion of the exudate is removed from the throat by means of forceps or a cotton-wool swab, freed of moisture as much as possible, and drawn to and fro on a slide. The thin layer which results is allowed to dry, and then fixed by heat in the usual way. In the thin portions of membrane which have adhered to the slide, appropriate staining will show the bacilli characteristically grouped in small colonies—the rods often lying side by side in a certain parallel arrangement —and also distributed singly or in pairs, end to end or side by side. In acute cases they may appear almost in pure cultivation. Their number, moreover, may not be commensurate with the rapid formation and spread of the membrane, as in laryngeal and tracheal diphtheria, in which bacilli may be remarkably sparse. In pharyngeal exudate of some standing they are usually associated with a large number of other bacteria. It frequently happens, however, that microscopical examination entirely fails to place the diagnosis beyond doubt. Indeed, it may be said that it cannot be implicitly relied on in any case, and culture experiments must be undertaken as a routine practice.

Concomitant Microbes.—As diphtheria is localised to mucous membranes freely exposed to the air, the bacillus is always accompanied by other microbes, some of which are capable of influencing the course of the disease, and modifying its characters. Prominent amongst these are the streptococcus, staphylococcus aureus, coccus Brizou of Roux, capsule coccus, and bacillus coli. Specially severe cases appear to owe their malignant character in a large measure to what Frænkel has called the pathological efficiency of these concomitant microbes.

Streptococci are very frequently present in pharyngeal and nasal diphtheria, and make a very decided impression on the morbid process. In different cases they appear to have different proliferative powers. If, through unfavourable circumstances, the resistance of the body is diminished, or if the virulence of the streptococci is increased, they penetrate into the deeper tissues, and may wander in thick swarms along the lymphatic channels, extend through the walls of blood-vessels, and be disseminated throughout the internal organs. Thus superadded to diphtheria we have a greater or

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lesser degree of septicæmia, with its contribution of high remittent fever and baneful influence on the heart. The local changes which this microbe is capable of producing on its own account are well exemplified by the acute inflammatory processes which it is capable of producing in several parts of the body. Thus, in the throat especially, it can alone or in conjunction with the staphylococcus give rise to membranous affections, clinically indistinguishable from true diphtheria. In cases of diphtheria, this streptococcus induces inflammatory or necrotic changes in the substance of the affected mucous membrane, and in the lungs and serous cavities. These changes are especially characteristic in the lymphatic glands, which become more or less swollen, the swelling sometimes extending to the periglandular tissue, and causing a diffuse hard swelling of the neck. This condition sometimes ends in suppuration with sloughing, and cultivation experiments reveal the streptococcus and the absence of the diphtheria bacillus. According to Roux, the virulence of the diphtheria bacillus is heightened through symbiosis with streptococci.

The *staphylococcus aureus* occurs in a considerable number of cases, and, according to Escherich, is more frequently met with in the laryngeal than the pharyngeal diphtherias. Penetration into the blood-stream and internal organs is comparatively rare, with the exception of the lungs, which it reaches by means of aspiration. The clinical course of the disease does not appear to be much influenced by this microbe.

A small coccus, first observed by Roux, and named by him *coccus Brizou*, is also a common attendant of the diphtheria microbe. It is generally found in mild cases.

The *capsule coccus* is not infrequently met with, and sometimes appears to add its special complication of pulmonary inflammation.

A *short rod*, similar in appearance to the bacillus coli, has been found by Escherich in severe cases attended by ulcerative processes in the air-passages.

Cultivation Experiments.

The cultivation of the bacillus of diphtheria on artificial media has now been brought to great perfection. The bacillus thrives especially in media rich in albumen, as blood serum, meat-peptone-bouillon, and the latter solidified with agar-agar or gelatine. Lœffler found that the addition of blood serum and glucose to bouillon gave the most vigorous growth. The medium must be of a weak but distinctly alkaline reaction.

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Vegetative growth is most luxuriant between 33° and 37° C. *Below* this optimum the growth is slower, and practically ceases at about 20°; *above* it, the growth is also slower, ceasing at 40°, with diminution of virulence.

A portion of membrane is removed, as already described, and rubbed on the surface of solidified serum or agar-agar in test-tubes or covered capsules. These are placed in an incubator at 37°. When the cultures cannot be made at the bedside, the piece of membrane or swab may be placed directly in a tube or bottle tightly corked for transport. A small tabloid tube is very convenient for the purpose.

On solidified *blood serum* the growth is very rapid at the body temperature, and very characteristic. It becomes apparent to the naked eye in about twelve hours, in the form of small transparent colonies, which, about six hours later, become white with sharply defined steep serrated margins and a dome shape. In twenty-four to forty-eight hours the colonies may have attained a diameter of 3 millimetres, with a peculiar moist appearance, and the colour tending to a slightly yellowish tint.

In *agar* (meat-peptone-bouillon and agar) the microbe displays a peculiarity which may be said to indicate a biological characteristic of this and other pathogenic bacteria—namely, that it accustoms itself more and more in succeeding generations to a medium originally unsuitable. Agar yields very characteristic growth—more especially if it contain about 6 per cent of glycerine—in twelve to eighteen hours, similar to, but less exuberant than, that on blood serum. In comparison to blood serum, its preparation is difficult and tedious, but in its practical usefulness for the purposes of diphtheria diagnosis, it is quite as efficient and as valuable as serum.

Gelatine (meat-peptone-bouillon and gelatine) is a medium of considerable practical value in the cultivation of the diphtheria bacillus. The growth is necessarily much slower than on other solid media, as the highest temperature that can be reached without liquefying the gelatine is 24° C. At this temperature the growth is microscopically visible in twenty-four hours in the form of minute granular, sharply defined, disc-like colonies. These become visible to the naked eye in other twenty-four hours as extremely minute points, the surface colonies showing more rapid growth by a marginal extension which appears as a delicate halo.

Egg albumen affords a very suitable soil, which deserves special mention from the ease with which it may be prepared. The inoculation of a raw egg yields an abundant growth

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without causing any very essential change in the appearance or odour of its contents. On sloped tubes or strips of cooked white of egg the growth is very similar to that on serum, but not easily distinguished with the naked eye.

Potato is not well adapted for the growth of the bacillus, from the fact that the reaction is, as a rule, slightly acid. A certain amount of growth appears when the surface is rendered alkaline by 2 to 5 per cent of soda solution.

In *bouillon* kept at the temperature of the blood, the growth causes a very characteristic diffuse fine muddiness from the formation of minute colonies which quickly sink to the bottom, forming a dust-like sediment, or adhere to the sides of the test-tube, while the fluid itself remains clear. The growth brings about very notable changes in the reaction of the bouillon first observed by Roux and Yersin. The addition of litmus to the medium reveals the fact that the bouillon becomes acid in the course of the second or third day, but returns again to its alkaline condition after some time, the duration of which varies from three to seven weeks. This *return reaction* depends on the supply of oxygen. Thus, it does not occur when the air is rigidly excluded, and, on the other hand, it may be brought about as early as the fifth day by the transmission of air. The *acid reaction* evolved in the medium causes the microbe to lose its virulence. The previous addition of glycerine hastens and augments this reaction.

Milk is very favourable to the growth of the diphtheria germ, being, in fact, comparable to bouillon; but it is not serviceable for the making of diagnostic cultures.

Examination of Cultures.

The morphological characters of the bacillus of diphtheria can only be fully studied in pure cultures. It appears as a plump rod, having a length roughly comparable to that of the tubercle bacillus or to the diameter of a red blood corpuscle. It is plump as compared with the bacillus of tubercle, being about twice as broad, slightly curved as a rule, and rounder at the ends. One of the ends is somewhat thicker than the other, giving the organism more or less of a club shape. The morphological characters are, however, subject to striking variations, according to the age of the culture and the nature and reaction of the culture medium. The club shape becomes more manifest with the age of the culture, and, finally, so-called degeneration or involution forms appear, in which

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the organism is seen to have become greatly elongated and probably more or less distorted.

The use of staining reagents is necessary for the full display of these and other distinctive appearances. Almost any of the ordinary aniline dyes may be employed, but the result differs according to the strength of the stain. With strong solutions, such as carbol-fuchsin on aniline-gentian-violet, the colour is absorbed with great rapidity and intensity, and the bacillus appears uniformly stained from end to end, and apparently increased in length and breadth. Such strong solutions are useful only for defining the contour of the organism, and rendering it conspicuous amongst other species, as in preparations from the throat. A weak stain is necessary for the differentiation of the cell contents, and for this purpose a weak watery solution of methylene-blue, fuchsin, or gentian-violet gives excellent results. The solution known as Lœffler's alkaline-methylene-blue, consisting of 30 parts of saturated alcoholic solution of methylene-blue and 60 parts of 1 : 10,000 solution of caustic potash, is most generally used. The solution stains sufficiently in about two minutes, and is hastened by gentle heating. At the same time, preparations may be left in the solution over night without harm. Thereafter they are placed for a few seconds in a 1 : 200 solution of acetic acid, if further differentiation is required, washed in water, and either examined at once in water or dried and mounted in balsam.

The bacillus appears by this method of the same size as in the unstained condition. It shows an unequal staining of its protoplasm (unless in the earliest stages of growth, when the organism appears smaller and stains uniformly), parts of the protoplasm in the form of discs and granules being deeply stained ("chromatic substance") and separated from one another by uncoloured portions ("ground substance"), giving the rod a segmented appearance. A contrast staining of the protoplasm is obtained with carbol-fuchsin and Lœffler's solution, in which the ground substance is red and the chromatic substance blue.

This differentiation of the protoplasm is at first sight extremely suggestive of spore formation, but closer observation fails to reveal typical endogenous spores. The mode of reproduction is not yet clearly made out. It is to be observed, however, that the elongated club-like form assumed by the organism in full development bears a close resemblance to the formation of conidia by some of the higher fungi, and may be charged, like the conidia, with a reproductive function.

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The pseudo-diphtheria bacillus.—A bacillus presenting the characters of the bacillus diphtheriæ is often found in the mouth of healthy individuals. It is known as the Hofmann-Lœffler bacillus, and often designated the pseudo-diphtheria bacillus. Certain minute cultural differences have been noted by Escherich as distinguishing the pseudo-bacillus—namely, colonies pure white and more moist on serum; more luxuriant growth on agar; more rapid growth in gelatine, growing even under 20° C.; more rapid growth also in bouillon, the fluid remaining alkaline, or, if it becomes acid, the return to alkalinity takes place quicker. The bacilli are shorter, thicker, and frequently swollen in the middle. They present the same tendency to parallel arrangement as the true bacillus. All these differences are very trifling, and are not always to be distinguished. Roux and Yersin found that the two bacilli showed no essential difference in their growth on serum, and that the organisms could not be distinguished except by inoculation experiments, the pseudo-bacillus being harmless. They consider, therefore, that the pseudo-bacillus is simply the true bacillus with its virulence attenuated. In common with other observers, they found the pseudo-bacillus in a large number of children not affected with diphtheria. It is believed also by these observers that, under the influence of special circumstances, as of symbiosis with streptococci, the pseudo-bacillus can regain its pathogenic powers, and give rise thus to genuine diphtheria. Experiment has not yet, however, confirmed an opinion which, if true, would afford an ingenious explanation of many cases of sporadic origin.

This pseudo-diphtheria bacillus, then, at first sight, presents a serious difficulty in bacteriological diagnosis. It is, nevertheless, a matter of common experience that the finding of a bacillus with all the morphological and cultural characters of the bacillus of diphtheria is the most reliable means of diagnosis.

It is important to bear in mind, in connection with this part of the subject, that after an attack of diphtheria the bacilli may remain in the mouth for weeks or months. These bacilli may retain their virulent potentiality, and so be the means of communicating the disease to others, or gradually lose it, and, it is reasonable to believe, pass by degrees into into the harmless pseudo-bacillus. We have in this retention of the bacilli in the mouth a source of infection hitherto undreamed of, and a possible explanation of the origin of a large number of sporadic cases.

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Inoculation Experiments.

Experimental inoculation of animals with the diphtheria bacillus, places it specificity as the pathogenic agent beyond doubt. The domesticated animals are especially susceptible to inoculation, but rarely fall victims to the disease by the way of ordinary infection—the membranous inflammations which they frequently show, and which very closely resemble the true diphtheria of man, being commonly induced by microbes other than the bacillus of human diphtheria. Taking the pigeon, rabbit, guinea-pig, sheep, or dog, if the mucous surface of the conjunctiva, pharynx, trachea, or vagina is inoculated by vigorous in-rubbing of the pure culture, an inflammation with fibrinous exudation duly takes place at the injured spot. The animal exhibits a morbid process, attended by the same train of symptoms as in human diphtheria, and the same remarkable variation in severity. The animal may die during the course of the acute stage, from diphtheria intoxication, or the surface may heal and the characteristic paralysis appear in due course, or the animal may die from progressive cachexia. It is remarkable that subcutaneous inoculations are less fatal than those on free surfaces. When introduced under the skin, the bacillus frequently does not kill the animal, but merely induces a local necrosis of tissue. This appears to be dependent on the influence which free access of air has in promoting the vegetative and pathogenic activities of the germ. When death is produced by a subcutaneous inoculation, a very characteristic and instructive series of changes result, and this mode of experimentation is made use of in identifying the bacillus and testing its virulence. At the inoculation place, in a guinea-pig for example, there is a fibrinous exudation surrounded by an extensive hæmorrhagic œdema. The neighbouring lymphatic glands are enlarged and hyperæmic, and there is usually dark reddening of the suprarenals. The first part of the small intestine is distinctly injected. In the pleura and occasionally in the peritoneum a serous exudation occurs. Rabbits show, in addition to these changes, diarrhœa and fatty liver. Some animals may outlive the inoculation weeks or months, becoming extremely emaciated, with necrosis at the inoculation point and consolidation of the lungs, the earlier changes having disappeared.

In animals dying in the acute stage, or those inoculated on mucous membranes, the bacilli are only found at the inocula-

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tion point, the internal organs being free of them, as a rule. Death, therefore, results, not from the multiplication of the bacilli through the body, but by the absorption of poisonous products evolved at the place of inoculation. The proof of this was furnished by Roux and Yersin. They removed the bacilli from a pure culture by means of filtration, injected the filtrate, and found that the same lethal and paralytic effects were elicited. The only difference in the local changes was the absence of the fibrinous exudation. By this means they held the limitations of the disease, as it were, in their hands, and could regulate the result very much by the dose: the smaller the dose the more protracted the disease, and the greater the likelihood of paralysis ensuing. One fifth of a cubic centimetre of the filtered liquor was sufficient to kill a guinea-pig within thirty hours.

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Dr. RUFFER.

Dr. Armand Ruffer, Director of the British Institute of Preventive Medicine, was the next speaker. After thanking the members of the Society for their enthusiastic reception, he said that he thought it would perhaps conduce to the interest of the meeting if he limited his remarks to that part of the subject of which he knew something from practical experience. He would thus deal—

I. With the question of the diagnostic value of the diphtheria bacillus;

II. With the methods of preparing toxin;

III. With the methods of inoculating horses, so as to obtain a maximum of immunising power in a minimum of serum; and

IV. With what appeared to be the pathological bearing of the subject under discussion.

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I. Dr. Buchanan had already entered so fully into the question of the diagnostic value of the diphtheria bacillus that there was not much to say on that point, but there were a few practical details which he might mention. The usual way to make the diagnostic investigation was to take a little piece of cotton wool, charged with membrane or discharge, and to rub it on the sterilised serum, expecting to get colonies developed in sixteen to twenty-four hours. That was a very good method, but it had its disadvantages. The serum usually used was horse's blood serum, and it was not altogether satisfactory. Lœffler used sheep's, but that was not easily obtainable—in London, at any rate—and it required sterilisation at 60° C. for a week, and even then sterilisation was not certain, 20 per cent of their tubes often being found not sterile. Dr. Hunt, who was assistant in the Institute, used a method by which, in a few minutes, sterilisation of serum could be effected. His method was a modification of Lorrain Smith's, and was to add to the serum ·6 per cent of caustic potash. Dr. Ruffer did not know what was exactly the change which took place, but the result was that one could sterilise the serum in an autoclave at 120° C., and so in an hour have plates or tubes ready for inoculating. He showed a plate which had been thus prepared, and which showed a culture of forty-eight hours' growth.

As to staining reagents, Dr. Ruffer had been in the habit of using vesuvine and methylene blue, and so obtaining a contrast-stain, parts being blue and parts being yellow. He had found this to be a very satisfactory method.

II. It was, he said, a difficult matter to get large quantities of highly poisonous diphtheria-toxin. One wished to get it as toxic as possible, and now, by a modification of the method described by Roux, they could obtain it of such a strength that $\frac{1}{10}$ c.c. would kill a guinea-pig, and 1 c.c. would probably kill a horse. Though it was not known what were the chemical constituents of this toxin, it was thus evident that it was one of the most deadly poisons. As to its preparation, that was done by ventilating a veal-broth culture of the bacillus, either by passing air over the veal-broth (Roux) or by bubbling air through it. It was the latter plan which Dr. Ruffer now employed; with it a great deal of time was saved, a virulent toxin being obtained in seven to twelve days, instead of in three to seven weeks, as required by the other. This saving of time was a most important matter when one had to provide toxin, as he had had lately,

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on short notice. Dr. Ruffer showed to the meeting the apparatus employed in the different methods he had mentioned, and also an arrangement invented by Dr. Hunt for inoculating the large flasks needed without entrance of air. In connection with this apparatus shown, it had been evident that it was of importance to keep the diphtheria bacilli in contact with air. The only method of doing so, so far, had been by ventilation, but Dr. Ruffer went on to say that Dr. Hunt had pointed out that if one could keep the bacilli on the surface of the broth, many of the complications of the flasks might be dispensed with. If, for example, small pieces of cork were floated in the broth, the bacilli were found to cling to them, and so remain in contact with the air; a layer of vaseline on the surface gave similar results. Those latter methods were now used, and one could get as good toxin in as short a time, and without complicated apparatus.

As to the *chemical composition of the toxin*, Dr. Ruffer had read with the greatest interest all the papers on this subject which he had been able to obtain, and they showed a distinct step in advance, and led one to hope that in time they might be able to isolate the toxin and study it further. To talk of an albumose as the true poison was somewhat premature, as it was much weaker than the crude poison. He thought that those albumoses, which were found formed in the broth, were only contaminated with poison, and not the poison itself. Up till recently, one sowed the poison in an albuminous fluid, and finding the poison to develop, thought it was due to the decomposition of albumen. That, however, was a mistake, for it had been shown (in France, in Germany, and in Dr. Ruffer's laboratory) that it was possible to get a good supply of the chemical poison by growing the bacillus in a mere saline fluid. One must suppose, thus, that the albumose was formed by constructive changes, and not by destruction of the albumen.

III. As to the preparation of immunising serum. The animal now used was the horse, and lately, with the help of Mr. Robertson, Dr. Ruffer had immunised twenty-one horses. At first it had been thought that any horse would do, but now they had agreed that it was better to pay more for a young horse than to get an old horse cheap. It had to be made certain that the horse was not suffering from tubercle or glanders, and this was done by isolating the animal and trying the effect of injections of tuberculin and of mallein. If no reaction took place with either, they were as certain as they could be that the horse was free from those diseases.

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The horse's temperature was also taken night and morning for a week. All this being done, there were two broad ways of immunising against diphtheria—(1) by pure culture (Behring and Klein's method), and (2) by toxin. The former plan was good if one were in a hurry, but it was dangerous, because with it one was dealing with a living organism, and one never knew what it would do. If one inoculated with toxin, the results could be measured more exactly. But, even with toxin, great care was necessary, as there seemed to be great idiosyncrasy on the part of certain horses. An instance, illustrative of this point, was referred to in detail. It was, thus, a good rule to begin with very small doses, which were gradually increased until even 200 c.c. might be given three times in a week. At first Dr. Ruffer had thought that it was of importance to use large doses, but he had soon found that that was a mistake, and that it was better to work them up from small doses to, say, 50 c.c. thrice in the week. If the horses were looked after properly, they kept in good health. Though they resented the inoculations at first, they did not do so after the fifth or sixth.

After a horse was thus rendered immune, instead of the typical rise of temperature of 2° C. (on injection of toxin), there was either no rise at all, or only a rise of ·5° C. This failure of the temperature to rise showed that the animal was probably immune. One might then draw off a small quantity of its blood, and test its value. There was no great difficulty in the case of the horse of getting a large quantity of blood. After all antiseptic precautions had been taken, the part being shaven, a notch about half an inch long was made in the skin over the jugular vein (which lay very superficially). The incision was made only so deep as was required to render the wall of the vein visible. A trocar was then pushed in, in an upward direction; a sense of resistance might then be felt (it was supposed from the valves), and the trocar had to be pushed through this else the blood would be found to flow very slowly. In this manner 10 to 15 litres of blood might be obtained every ten or twelve days; but, after 8 litres had been withdrawn, the blood often did not present normal appearances on standing, and the serum was found to be red. As they had many immunised horses now, they accordingly made it a rule to withdraw only 8 litres at a time, except in the case of one horse which could give 14 at a time without any such occurrence. The flask for the reception of the blood was shown by Dr. Ruffer, and the method of filling the sterilised tubes explained. In filling those tubes there was

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necessarily some exposure to the air, so they might occasionally get a mould or other extraneous micro-organism gaining entrance. One tube of each set at least was accordingly set to stand in an incubator at 38° C. for forty-eight hours, and if nothing developed they counted that for all practical purposes there had been no contamination. In the many thousands of cases in which the immunised serum prepared by Dr. Ruffer had now been inoculated, he had heard only of one abscess having formed.

Supposing the serum to be ready, how were they to test its value? Dr. Wright of Netley had rendered much assistance in the answering of this question. One injected a known dose of toxin into a guinea-pig, and thus found the dose of toxin which proved fatal to that animal ($\frac{1}{10}$ c.c.) Then one mixed with that known dose of toxin a known quantity of immunising serum. Different proportions were tried, and even when the proportion of the serum was as low as $\frac{1}{10000}$ c.c. the disease did not develop. $\frac{1}{10000}$ c.c. was thus proved capable of protecting against a fatal dose in the case of the guinea-pig. In this very small quantity it was almost impossible to get any chemical reactions, but yet it had this preventive power. The two (the toxin and the "antitoxin"—though that was not a good name) must be mixed in order to get the maximum therapeutic effect; for, if the toxin were injected on one side of the body and the "antitoxin" on the other side, it required 14 times as much to protect the animal. If there were delay of one hour in using the "antitoxin," 100 times as much would be needed; if delay of eleven hours, 5,000 times as much. It was thus a difficult question to say, from experimental evidence, how much "antitoxin" should be injected in man.

As to the *chemical composition of "antitoxin."* When one precipitated the albuminous part of the serum, it was found that the curative substance came down too. This was the essence of Aronson's method, which, Dr. Ruffer regretted to say, had been patented.

IV. What, then, was this "antitoxin?" How did it act? When Behring read his first wonderful paper one was struck with its leading idea. Dr. Ruffer imagined then, and many imagined still, that the "antitoxin" must act towards the toxin in a manner similar to that by which a certain quantity of acid could neutralise a certain quantity of alkali. If that were so, then one would expect that it would be true for the whole scale. Ten times as much sulphuric acid would

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neutralise ten times as much alkali, but it was not so with toxin and "antitoxin." If one part of toxin were neutralised by one part of "antitoxin," ten parts of toxin required not ten but only two parts of "antitoxin." There was thus not a simple chemical equation. Again, if ten guinea-pigs were taken, and each given a dose of toxin, with the same quantity of "antitoxin" to each, it would not be found that ten were saved; eight or nine would, but the other would be lost. It was thus evident that there must be another factor, and that was probably to be found in the cells of the body. Another way of showing this was by injecting under the skin of an animal a certain quantity of toxin and of "antitoxin." No symptoms might supervene, and it might be said that the toxin had been neutralised. It was not so, however; for, if the injection be made into a vein, and not under the skin, the animal would die of diphtheria just as if nothing had been done to protect it. The cells of the body must thus have some influence in curing the animal.

It might be asked what were the cells which were likely to have this function. It was only a tentative opinion, but Dr. Ruffer was inclined to think that they must include not only the white cells of the blood, but also the whole of the cells of the mesoblast.

One obtained the same results from the toxin as from diphtheria bacilli. Now, it was known that the leucocytes could fight the bacilli, and under the membrane they found degenerated bacilli inside leucocytes. The leucocytes would probably do the same to the toxin. In this connection, it might be recalled that, if one injected a soluble salt of iron, after a time one did not get it in the blood as a whole, but in the cells which were phagocytes, or in the large cells lining the vessels in the liver. These latter took up this salt of iron and altered it, and it was found in them after death. Probably some similar action took place in the case of toxin. Another organ which had to do with the separation of toxin was the kidney. The urine from a child suffering from diphtheria or recovering from that disease, if injected into an animal, led to its having diphtheritic paralysis.

To show that "antitoxin" does not act in the way of neutralising, and that there must be some other factor, there was, further, this fact that when a guinea-pig died after inoculation with toxin its blood was found to contain "antitoxin," which had the power of preventing toxin from affecting another animal. The dead animal's body was loaded with "antitoxin" and yet it died, and so it was in fatal cases in

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man. The action of "antitoxin" in respect to toxin could not, therefore, be of the nature of a chemical reaction, but a reaction produced through the cells of the body.

In order to obtain a clearer idea of the action of the "antitoxin" or curative serum, one might compare diphtheria with other diseases in which it had been proved that the serum of the animal protected, for, with certain variations, the various specific febrile diseases might be considered quite analogous one to another. If, for example, an animal were rendered immune against typhoid fever or cholera, the serum of that animal could cure another animal inoculated with typhoid or cholera bacilli. This blood, however, had no appreciable effect on either the typhoid or cholera toxine. The blood, therefore, in this case was not antitoxic, although it was distinctly curative. In diphtheria also the serum had an effect not only on the poison, but also on the bacilli of diphtheria, for in man and animals it protected against both.

Coming to the use of "antitoxin" in the human subject, the questions arose—How much should be injected in a child, and how should it be injected? The best results seemed to be obtained when the inoculation was made in the flank. Least pain was caused there; that was the site of injection in the treatment for rabies in Pasteur's Institute. As to the quantity to be injected, that was a point which Dr. Ruffer must leave to the clinicians to find out. At present the authorities at the British Institute of Preventive Medicine recommended 10 c.c. for mild cases, and 15 to 20 c.c. for the more serious. They might have to modify these rules.

There was one consideration which made it more difficult to use the curative substance in man than in any other animal. It had been found that when one wished a virulent toxin one had to ventilate the culture. Now, if it were borne in mind what was happening in the throat, it would be seen that the bacillus had all the conditions required for forming a virulent toxin on account of the air passing over it in respiration. Accordingly the toxin in the human subject was of an exceedingly virulent character.

Another point to which he might refer was the fact that one could suspend the action of the curative serum entirely, if, along with the toxin and the curative serum, one injected another micro-organism in a dose insufficient of itself to kill the animal. For example, if with 1 c.c. toxin and $\frac{1}{10}$ c.c. serum one injected $\frac{1}{10}$ c.c. typho-toxin (*i.e.*, so small a dose of typho-toxin that of itself it could have no effect in killing the

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animal), the typho-toxin would suspend the action of the curative serum (diphtheritic) and the animal would die of diphtheria. If more "antitoxin" were used the animal would be saved. Now, in the throat of the human subject similar conditions were found. The child was always being poisoned by the other micro-organisms present in the same surface, and it was thus that the presence of streptococci helped to explain the mortality from diphtheria.

Dr. Glaister said that, as the large dose of the curative serum had been objected to, perhaps Dr. Ruffer would say whether or not there was any hope of its being supplied in a concentrated form.

Dr. Ruffer replied that that subject had claimed a considerable amount of his attention. It was very easy to get the serum in an absolutely dry state by evaporation, at a low temperature, over sulphuric acid, *in vacuo*, and in the dark. There was, however, this practical difficulty—that, when the serum was once dry, like other albuminous bodies it was very difficult to dissolve it again. The curative substance could be precipitated from its solutions by everything that precipitated albumen; and though the albumen was precipitated at the same time, the curative element could be extracted by distilled water or ammonia. When the curative element was thus obtained pure, the loss was about 15 per cent.

Dr. NEWMAN.

Dr. Newman began by explaining that, while he might be expected to speak that evening of cases where antitoxin had been used, he thought it would be better now only to discuss the general question, and to leave the consideration of his individual experience of serum treatment till he made his reply, when he would take an opportunity of bringing some of his cases before the notice of the Society. Considering the late hour of the evening, he would limit his remarks to some general questions.

He said that diphtheria is now generally recognised as an acute infectious disease, which results from the entrance of a specific micro-organism into the system. The bacillus of diphtheria, when it alights upon a suitable soil, develops and propagates; but, unlike the organisms which produce other diseases, it does not enter the interior of the system. In other words, the bacilli are not taken up by the blood-vessels or the lymphatics of the infected part, as, for example, in

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such diseases as enteric fever, tuberculosis, and anthrax. In diphtheria the bacillus is implanted in the throat, and the membrane is formed there. The micro-organisms give rise to an acute inflammation; and, at the same time, as a product of their proliferation and growth, an animal poison is generated (the toxin of diphtheria), which in many respects closely resembles the poison secreted by snakes, bees, and other insects.[1] This poison is rapidly taken up by the lymphatics and blood-vessels, and distributed throughout the body.

Most writers on the subject of diphtheria regard the disease as closely analogous to the continued fevers or exanthemata, in that the blood-poison gives rise to a general systemic disturbance, while the inflammation in the throat they regard as the characteristic eruption of the disease; and they also consider that the regular course which attends the development and separation of the diphtheritic membrane supports the analogy. To this opinion Dr. Newman completely dissented, and he contended that the lesion in the throat indicated only the point of inoculation, and he argued that the severity of an attack of diphtheria was not always to be judged by the amount of membrane formed—in fact, sometimes the contrary.

A case which he had seen in 1886 seemed to throw some light on this aspect of the subject. It was a case of pure pharyngeal diphtheria. The patient was a child aged 10 years, and when he was asked to see the child the symptoms of diphtheria were by no means pronounced. The temperature was 99·8° F., the pulse 120, the throat was dry, and only on the uvula was there a distinct diphtheritic membrane seen. The posterior wall of the pharynx was swollen and deeply injected, but neither upon it nor in the larynx was there any diphtheritic exudation. Within six hours the patient became rapidly weaker, without any rise in temperature, but with distinct evidence of cardiac failure, paralysis of the muscles of deglutition, and albuminuria; and in eighteen hours afterwards died from syncope. At the *post-mortem* examination almost no evidence of inflammatory action further than marked hyperæmia was found in the mucous membrane of the throat; but fatty degenerative changes were very marked in the muscles of the pharynx, in the intercostal muscles, and in the myocardium, the lungs being hyperæmic and

[1] The virus of diphtheria may, however, have even a closer likeness to ichthyotoxicon, the poison secreted by sea-eels, which not only produces immediate constitutional symptoms, but remote paralysis, absolutely the same as diphtheritic paralysis.

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œdematous, the result probably of imperfect respiration from defective muscular action. The spleen and kidneys also showed evidence of acute irritation. These organs were enlarged, and contained in their substance small punctiform hæmorrhages, and the uriniferous tubules were the seat of acute inflammatory changes. There were also minute extravasations in the meninges and superficial portions of the spinal cord and brain. The red blood corpuscles were disintegrated, and the hæmoglobin partly dissolved out. This case seemed to him to be one of extremely acute poisoning, due in some degree to a want of resistance on the part of the mucous membrane of the throat.

Dr. Newman said that he regarded the inflammatory changes in the throat, and the formation of the diphtheritic membrane, as a protective process to resist the rapid absorption of the toxin; but in cases where no marked inflammatory protective process developed, the poison of diphtheria entered the system rapidly, and produced most grave effects within a very limited period. So also forcible separation of membrane might aggravate the severity of an attack by exposing a fresh absorbing surface. The membrane in diphtheria might be looked upon in much the same light as the so-called pyogenic membrane of an abscess, which was really a limiting membrane, and to some extent prevented the absorption of toxic matter from the contents of the abscess.

He said it was a recognised circumstance of the disease that when the poison was very virulent, and no very marked local inflammatory changes were produced in the mucous membrane, phagocytosis did not come into play, the products of the bacilli having evidently paralysed (if such a term may be used) the amœboid action of the resisting cells.

In order to understand the mode of action of *antitoxin*, it is of importance to study the subject of acquired immunity and protective inoculation. These two subjects have been much discussed both from the scientific and from the philosophical point of view, but no conclusion has been formed. Some careful scientific observers have very recently ascertained facts of considerable importance, and they have formed what they consider to be just opinions from their observations; but, at the same time, they doubt the accuracy of the observation of others opposed to them, and even hesitate in admitting their power of judgment. It must be conceded, however, that during the last few years a great amount of work has been done in connection with this subject, and many suggestions have been made to explain bacterial action,

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also the nature of immunity, which is obtained by protective inoculation.

Why should certain infectious diseases produce a protection against another attack, while in other similar diseases no immunity is produced? For example, such ailments as small-pox, diphtheria, and cholera produce a great degree of protection to the individual, while scarlet fever and measles induce a lesser degree of immunity; and, again, diseases such as ague, influenza, and erysipelas seem rather to render the patient more liable to a second attack.

Many attempts have been made to furnish a reasonable explanation of all this, but it is doubtful if a really reliable theory has yet been advanced. The exhaustion theory of Pasteur and Klebs assumes that, during the first attack of an infectious disease, some nidus or material necessary for the life and propagation of the micro-organisms is used up, and therefore the body of the host is no longer a suitable medium for the development of another attack. This theory was soon found to be insufficient, as bacteria could easily be grown in the body fluids of animals rendered immune.

Chaveau's retention theory—namely, that the microbes produce certain materials in the body of the host which are noxious to the bacilli themselves, and so prevent a second development of the disease. This theory, however, has not been accepted.

Grawitz tried to explain immunity by supposing that, as a consequence of the action of the organisms, the resisting energy of the cells of the body was greatly increased.

Another assumption was that advanced by Buchner in 1877, and may be termed the theory of local immunity. He supposed that reactionary alteration takes place at the seat of invasion, these parts being so affected that the least resistant cells are destroyed, while the stronger, which have survived from the first bacterial invasion, transmit to their descendants their resistant properties.

Then we have Metchnikoff's cellular theory, by which it is contended that phagocytosis is the most important factor in the production of immunity. He maintains that in immune animals phagocytosis plays a most important part. By the phagocytes, which may be leucocytes or proliferating connective tissue cells, the pyogenic micro-organisms are removed from the circulation.

Dr. Newman simply mentioned these different theories, and said that any members of the Society who were interested in the subject would find an admirable discussion on phago-

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cytosis and immunity in the *Transactions of the Pathological Society of London*, vol. xliii, p. 239, and also in a paper on the same subject by J. G. Adami in the *Medical Chronicle*, vol. xv, p. 95.

Both the toxin of diphtheria and the antitoxin seem to be similar in their mode of action to animal and vegetable alkaloids. Their *modus operandi* seems to resemble more that of ferments than that of ordinary chemical poisons. No one can contend that the antitoxin acts upon the toxin of diphtheria in the same way as an acid does upon an alkali; therefore, perhaps, the term antitoxin is not a strictly correct one. The whole theory, however, of the action of toxins and antitoxins is still a matter of speculation, and one does not feel justified to dogmatise upon the subject; at the same time, he was disposed to accept the phagocyte theory as supported by the bulk of evidence.

In a discussion of this kind it was quite impossible to consider the various methods by which diphtheria was disseminated. It was generally accepted that diphtheria may occur as an epidemic, or may become endemic in a district, or may arise sporadically. Sewage and sewer gases have been considered as the most favourable carriers of infection. Milk also, and other articles of diet, have been demonstrated as suitable vehicles for conveying the malady.

It was well known that cows are very subject to diphtheria, and it has been stated by Klein that, when these animals are infected, their milk contains the specific germs of the disease; but whether this is true or not has not been clearly demonstrated by facts. The circumstance, however, was well recognised that milk forms a favourable nidus for the diphtheritic poison.

Direct infection from domestic animals was a method by which the disease might be spread, but was one which was apt to be overlooked. It was an accepted fact that certain animals were more liable to the disease than others, and birds seem particularly susceptible.

In Italy diphtheria was common amongst poultry, and in that country, where the flat roofs of the houses were used as hen-coops, the cisterns and wells were apt to become contaminated by the diphtheritic poison. Many cases have been recorded where the disease has been communicated by poultry, turkeys, pigeons, and by game birds.

He mentioned an example which occurred in his own experience. In 1885 he was asked to see a case of diphtheria. The patient was a child aged 7 years, who suffered from a

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slight attack of pharyngeal diphtheria, with characteristic membrane, followed by the development of distinct diphtheritic paralysis. The mother of the child mentioned incidentally that the cat was ill. He had the cat killed, and on examination *post-mortem* found diphtheritic membrane on its nostrils and pharynx. Other similar cases have also come under his notice.

There are two questions of considerable interest—the one may be called acquired immunity, and the other developed susceptibility. Diphtheria was often said to be a very infectious disease, but he was disposed to doubt this in the ordinary sense of the term. While surgeon to the throat ward of the Glasgow Royal Infirmary he had had many cases of diphtheria under his care, and though there had been other patients, children as well as adults, in the ward, he knew of no instance in which the disease had been communicated from one patient to another; but, while this was true, he might add that he had himself suffered from slight attacks of diphtheria after operating upon patients suffering from the disease. In the early years of his practice Dr. Newman had often had attacks of sore throat after attending cases of diphtheria, and bacilli were found in the secretions of the mouth. The significance of the organisms he did not recognise at the time, but looking back, he now believed them to be those characteristic of diphtheria. A nurse also, who had attended many of his cases, suffered in a similar way. Now, however, he never had such attacks, even although his face was often, while performing tracheotomy, bespattered with the discharges from the trachea and mouth of the patient.

Such facts as to acquired immunity pointed very much in the same direction as the results of experimental investigation —viz., that if one introduced small quantities of poison into the system, the individual was in some way or other enabled to resist the disease; whereas if a large quantity was introduced at once, the phagocytes, or whatever the opposing power might be, could not effectively resist the poison. If, however, small quantities were gradually increased to larger ones, an amount of virus, which originally could not have been resisted, produced comparatively little harm. This fact was observed not only in connection with the action of the animal alkaloids of disease, but was also seen in the use of such mineral poisons as arsenic. Comparison might be made to an invaded country. If the foe attacked the country in small numbers to begin with, resistance to the attack was gradually developed, and an army of defence formed; but if

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the enemy invaded the country suddenly, and in large force, little or no resistance could be offered.

With respect to developed susceptibility, he had three cases which were of considerable interest. The first case of the series occurred just before he studied medicine, but he remembered it well, as the patients were members of a family intimately associated with his own. In 1869 the eldest daughter in the family died of diphtheria at the age of 18; two sisters, aged respectively 16 and 13 years, both escaped at that time, but the elder of the survivors died of diphtheria in 1872, the other escaping again, but dying from the same disease in 1875, when she was, of course, of about the same age as her sisters at the time of their deaths. This history seemed to point to the development of a condition of susceptibility, which was absent at an earlier age.

It is a well recognised fact that children are more prone to the disease than adults, but here we had a development of susceptibility at a certain age.[1]

Dr. Newman said that the question of diagnosis was in some instances extremely easy, in others very difficult. In all, it was of great importance to make a bacteriological examination, especially in those cases where antitoxin was used. In the great majority of cases of true diphtheria, the naked eye appearances of the cultivations upon horse serum were characteristic. The colonies usually appeared within twenty-four hours, as small opaque bodies about the size of a millet seed. They were prominent, and of an almost pure white colour. The only organisms at all resembling them in appearance were the Brizou cocci. These organisms differ from the diphtheric colonies in being flatter and more translucent.

The rapid development of the diphtheria colonies is also of importance from a diagnostic point of view. He thought that any one who approached the subject from a scientific point of view, must not trust altogether to clinical experience, but must also have means of making cultures. As far back as 1887 he had made cultures, his medium being a hard-boiled egg, from which the yoke had been scooped out. The white

[1] Every one who has seen many cases of diphtheria recognises the importance of family predisposition, not only to the disease, but to severe attacks of it. I have seen instances where, on mentioning the nature of the disease to the parents, they assured me that they had no hope of the child's recovery, even although the attack was mild, and my prognosis favourable. The parents, judging from their family experience, generally proved their opinion to be correct.—D. N.

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of the egg was inoculated, and the removed portion of the shell used as a cover. The egg was then put in a warm place, and within twenty-four hours the colonies developed sufficiently for microscopic examination to be made. Any practitioners may now get, from the British Institute of Preventive Medicine, culture tubes of horse serum; but, failing that, calf-foot jelly or the white of egg may be used as a medium.

He quoted the case of a family nurse, where he experienced great difficulty in making a diagnosis. She suffered apparently from an ordinary pharyngitis, and during her illness she continued attending to the children under her charge. Only a small yellow speck appeared on one of the tonsils, just like a follicular tonsillitis. It was removed and examined for diphtheritic bacteria, microscopically and by cultivation, with negative results. Other examinations were also made of the secretions of the mouth, without the discovery of any diphtheritic bacilli, and yet, later on, the nurse developed diphtheritic paralysis.[1] Ten days after the nurse took ill, one of the children of the family was laid up with an attack of typical diphtheria. The absence of the diphtheria bacillus in the secretions of the mouth did not therefore prove an acute pharyngitis not to be diphtheria; but, on the other hand, he thought that it would be admitted by all that the detection of diphtheritic bacilli proved the presence of the disease. He then referred to the prognostic value of a bacteriological examination in true diphtheria, and said that the fewer the bacteria in the exudation, the less severe is the case likely to be. He found that where the colonies rapidly developed upon a cultivating medium, the case was likely to be severe, and this was especially so if the bacilli were large and the cultivations comparatively pure—that was to say, where no other organisms developed along with the diphtheria colonies in the tubes, even after several days. When comparatively few, or only small impure colonies developed, the case was likely to be mild. He had two cases, however, where pure cultivations developed vigorously in very mild attacks.

When the diphtheria colonies were contaminated with streptococci or Brizou cocci, the cases were likely to be mild.

Both from a diagnostic and from a prognostic point of view, the rapidity of development of the colonies was a point of great practical importance.

[1] In this case no diphtheritic membrane was discovered, although, of course, it may or must have been present in a situation not visible.

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As regards the *use of antitoxin*, he thought the most important point was early diagnosis, verified by cultivation experiments, and followed by prompt treatment. In his own hands the treatment by antitoxin had not been so successful as by those who had charge of diphtheria wards, and had the opportunity of treating large numbers of cases during the earlier stages of the disease. Anyone like himself, who mostly saw cases in consultation, was, as a rule, called in at an advanced period of the disease—that is to say, after the toxin of the diphtheria had produced serious effects. In such cases little good could be expected from such an agent as the diphtheria antitoxin. Cases seen by him during the early stages of the disease reacted well to the antitoxin; but in cases injected after the fourth, fifth, or sixth days the agent had little or no effect further than reducing the temperature, and probably in some instances promoting the separation of the diphtheritic membrane. In advanced cases it was extremely difficult to judge the effect of the antitoxin.

Many cases had been reported where an apparent cure has been effected by the antitoxin, but similar apparent success has been observed in cases where no antitoxin was used.

He said that he remembered well a case he was asked to see by Dr. Gilmour of Duntocher. The case was a severe one, and the patient was so much prostrated that it was considered, both by Dr. Gilmour and by Dr. Newman, inadvisable to perform tracheotomy, there being clear evidence that the diphtheritic membrane had extended into the ramifications of the bronchia on the left side of the chest. He advised the use of a spray of perchloride of mercury, but at the same time entertained very little hope of the patient's recovery. He met Dr. Gilmour some months afterwards, and was surprised to learn that soon after the spray was commenced the patient began to mend, and was now alive and well; but no one could possibly claim, in this instance, that the use of the spray had any effect in promoting a cure. If antitoxin had been injected in that particular case the same result would doubtless have followed, and the serum would probably have been credited with producing a cure with which it had nothing to do. But, while antitoxin was not of the same use in late cases as in early ones, still the employment of it may produce some beneficial effect. His opinion was that the treatment by antitoxin should be in the hands of the general practitioner, or the general practitioner should ask consultants to see their cases of diphtheria at an early stage of the attack. Whenever one was satisfied as to his diagnosis, not

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only by clinical experience but by cultures and by microscopic examination, he should use the antitoxin, and he may do so without fear of doing harm.

Every hour was of importance. Sceptics might say that when antitoxin was used, and a cure followed, that the case was not one of diphtheria at all. He was willing to run that risk by treating the case at once, and waiting for the bacteriological examination to confirm or disprove his diagnosis. If the practitioner thought it was diphtheria, let him use the serum—it would do no harm; if the case recovered that was all that was desired. He said that, in all his cases where antitoxin had been used, he continued also to employ the older methods of treatment; but to these it was not necessary to refer.

He might now say a few words regarding the mode of employing the antitoxin of diphtheria. It must be remembered that there were many antitoxins to be had, and anyone recording cases should at the same time mention the source of his antitoxin.

Firstly, there was Behring's serum, which had been modified to some extent into Roux's antitoxin. Then, secondly, there was Hans Aronson's antitoxin, prepared in Berlin. This preparation of antitoxin had been looked upon with some doubt by certain surgeons, and regarded as a secret remedy. It has, however, one advantage, that the solution employed was of one uniform strength, 5 c.c. constituting a single dose, and being usually sufficient in cases where the injection was made at the commencement of the attack, or in mild cases. Twice that amount may be injected in more severe cases, or when the treatment has been adopted after forty-eight hours; while again, in extremely severe cases, 15, 20, or 25 c.c. may be administered, without regard to the age of the patient. Thirdly, diphtheria curative serum, prepared by Ruffer of the British Institute of Preventive Medicine, and by Professor Woodhead. Fourthly, another kind introduced and supplied by Dr. Klein. This latter preparation was obtained, not by injecting the toxin of diphtheria only, as in Roux's process, but by introducing the diphtheria bacillus as well into the body of the horse. It was claimed that by this method a horse was rendered immune more rapidly. Fifthly, Burroughs, Wellcome & Co., London, have introduced an anti-diphtheritic serum exsiccatum, 1 gramme equal to 10 c.c. of liquid serum, which was supplied in gramme tubes, the contents of which may be dissolved in 5 c.c. of water, boiled, and cooled immediately before use, and are sufficient for a dose.

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Dr. Newman said the serum of which he had most experience was that known as Behring's diphtheria antitoxin. He had been fortunate enough to receive a considerable quantity of it during the early autumn of last year, and had employed it in a considerable number of cases during the severe epidemic of diphtheria which visited Glasgow and the West of Scotland during the months of October, November, and December last. The method of using the serum was as follows:—The syringe employed was the one recommended by the British Institute of Preventive Medicine. The syringes were made of different sizes to contain from 10 to 25 c.c., and may be obtained either at the address of the Institute, or from Messrs. Baird & Tatlock, 40 Renfrew Street, Glasgow. Before using the syringe it should be boiled, or be carefully washed out with methylated spirits, carbolic solution, and boiled water. The syringe having been thoroughly cleansed, the dose of the serum was introduced under the skin. The injection was usually made behind the shoulder, or under the skin of the abdomen. If the skin had been previously washed carefully with soap and water, turpentine and spirit, followed by the free use of carbolic acid solution, 1 in 20, little or no tenderness or pain was experienced by the patient.

It was best not to fix the hypodermic needle firmly to the syringe, especially when one was dealing with young children, in order to prevent any injury resulting from movement of the patient.

The quantity of serum employed depends upon two facts —firstly, the severity of the attack, and, secondly, the kind of antitoxin employed; for example, the ordinary dose of Behring's or Aronson's serum was from 5 to 10 c.c., whereas Ruffer's curative serum was employed in doses of 20 c.c. for a severe case, 15 c.c. for a moderate case, and 10 c.c. for a mild case. Again, the serum derived from different immunised animals varies greatly, the serum from some horses being more potent than that derived from others. As a general rule, however, it may be said that a standard dose having been fixed for a certain serum, the amount given to the individual should be regulated, not by the age of the patient, but by the severity of the attack.

From statistics which have been collected by Dr. Newman, he found that, taking hospital cases all over for a considerable period of years, the mortality in diphtheria showed an average of 36·7 per cent deaths, which was a much lower rate than Dr. Newman has experienced in his own private practice, for the simple reason that he was asked to see the more severe

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cases, many of them requiring immediate tracheotomy. On the other hand, taking the mortality in hospitals where the cases had been treated by serum, the average mortality was 18·1 per cent—that was to say, a reduction in the mortality to almost precisely a half. This fact speaks strongly in favour of the employment of diphtheria antitoxin.

These results are closely similar to those observed by the medical officers of the Eastern Hospital, London; and the following table shows the mortality there:—

CASE MORTALITY OF DIPHTHERIA IN CHILDREN UNDER 15, AT THE EASTERN HOSPITAL, LONDON.

	Cases.	Deaths.	Mortality per cent.
1893, ...	397	166	41·8
1st January to 22nd October, 1894, . . .	400	144	36·0
1st January, 1893, to 22nd October, 1894, .	797	310	38·8
14th September to 22nd October, 1894 (39 days), cases not treated with serum, . . .	72	28	38·8
23rd October to 27th November, 1894 (36 days), cases treated with serum, ...	72	14	19·4

In Dr. Newman's severe cases, comparatively little effect was produced by antitoxin within forty-eight hours of the injection, but after that time, if the patient had not succumbed to the disease, the temperature, if previously high, fell, and the pulse became more regular and slower, but in regard to the more severe cases he did not feel justified in expressing any very definite opinion. In milder cases, or in those where the injection was used early in the progress of the disease, the antitoxin exercised a marked effect, as shown by the sudden cessation in the growth of the membrane, an improvement in the general strength of the patient, and a distinct fall both in the pulse rate and the surface temperature in such instances where the temperature had been previously raised. In instances where the glands in the neck were swollen, the swelling subsided within forty-eight hours.

Dr. Newman said that, considering the late hour of the evening, he could not make any remarks as to the detailed history of cases, but he hoped to have sufficient time at his disposal to do so in his reply; in the meantime he was confident that antitoxin was a valuable agent when employed early in the course of an attack of diphtheria. General practitioners were, therefore, more likely to get good results if they employed the serum as soon as they were satisfied as to the nature of the disease.

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Dr. Napier asked if Dr. Ruffer could give any indication as to the dose for a child, according to its age or body-weight.

Dr. Newman said that the dose depended upon the day of illness and upon the virulence of the attack.

Dr. Napier asked if they were to understand that the dose was the same for a child of 12 months and a child of 12 years.

Dr. Ruffer agreed with what Dr. Newman had said, and added that the dose depended far more on the susceptibility and on the stage of the disease than on the weight of the child. Experimental investigation confirmed this view. It was known that certain kinds of animals required less than others. The dose depended more on age than on body-weight: thus a young rabbit, although lighter than an adult, needed more "antitoxin" than one of mature age. There thus seemed to be a difference rather of quality than of quantity. Drs. Washbourn and Goodall, who had been the first in England to use the curative serum, said that the dose was the same for a baby and for a child of 6 years. That this was perhaps not quite correct was supported by other statistics. The most striking results reported to the British Institute had been for children under 2 years. The normal death-rate under the Metropolitan Asylums Board had formerly been 60 per cent for that age; out of 300 cases (under 2 years) recently treated, the death-rate had been 20 per cent. Among children of 4 or 5 years the mortality had not diminished so much. Dr. Ruffer thought that probably the older children should have had larger doses. This question, however, must be studied from the clinical point of view, and he could not himself offer an opinion upon it.

(*To be continued.*)

OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Session 1894-95.

Meeting VI.—24th April, 1895.

The President, G. A. Turner, M.D., *in the Chair.*

I.—Case of Congenital Asymmetry.

By Dr. Lindsay.

Dr. Lindsay showed a boy, aged 14, with congenital asymmetry. The right arm was much larger than the left.

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All the parts were enlarged. The condition had existed from birth. No other parts of the body were affected.

II.—UNUSUAL GYNÆCOLOGICAL CASES.

By Professor Murdoch Cameron.

Professor M. Cameron read notes of some unusual cases met with in gynæcological practice.

Case I.—A vesico-vaginal fistula which had resulted after a forty-eight hours' labour. Several attempts to close it had been made by a surgeon. After several more trials she was discharged as incurable, but her condition was so wretched that she was readmitted. The whole urethra had been opened up, and the finger passed into the bladder. The vagina was occluded. Dr. Cameron cut down on each side of where the urethra had been, and then, making a posterior flap, turned it up, and stitched it so as to form a floor for the bladder, leaving a small opening through which the urine could escape. The vagina was then occluded. The operation wound healed, and patient left fairly comfortable.

Case II.—Ovariotomy with pregnancy at the third month. The case did well until the wound was healed, the stitches being taken out on the tenth day. Next day she aborted, and then pus began to exude from the wound. A hardness was felt in the flank. He reopened the abdomen and found a pair of pressure forceps had been left attached to the pedicle ligature. In a day or two a fæcal fistula formed. The abdomen was opened again after a time, and the bowel resected. She made a good recovery after that.

Case III.—Calculi in the bladder. He had done Cæsarian section on this patient in 1892. Two years later she had been in the Hospital with an attack of pelvic cellulitis, which had subsided under ordinary treatment. In January, 1895, she was admitted, complaining of pain on micturition, of five months' duration. Calculi were detected. The urethra was dilated, and three stones were seen suspended from the bladder roof. The first stone removed was on a single silk ligature, the second had two ligatures, and the third broke off, leaving the ligature in the roof of the bladder. As this ligature was firmly fixed, he left it. She has since returned with another stone on it. The ligatures were quite fresh. Nature had tried to expel them, just as the bones of an extra-uterine fœtation are got rid of. Dr. Cameron said he now uses chromicised catgut in his Cæsarian sections, and has found it answer admirably in the last three.

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CASE IV.—Dilated gall-bladder with calculi in it. It was supposed to be ovarian when admitted. There was a pyriform cyst, evidently connected with the liver. It extended below the umbilicus, and was the size of a small child's head. He opened the abdomen and found it to be a distended gall-bladder, from which he removed three stones, one about the size of, and resembling, a nutmeg. She made a good recovery.

In the discussion which followed,

Dr. Sloan congratulated Dr. Cameron on his success in the cases, and his courage in publishing the second case. The adventures of the forceps and the travels of the silk sutures had been very graphically described. He had nothing particular to say about the cases, but he asked how long the woman had been able to retain urine in the vaginal bladder?

Dr. Cameron replied several hours.

Dr. G. Balfour Marshall said that amenorrhœa was present in cases of vesico-vaginal fistula usually so long as the urine escaped by the fistula, but menstruation usually recurred after closing of the fistula. It would be interesting to know if it had recurred in this case, or if there was any opening for the flow to escape through. He related a case he had recently seen, where the vagina had been occluded, and the menstrual blood was now escaping through the urethra. In regard to silk ligatures escaping through the bladder, he had seen this happen in three cases in Germany, where the uterus had been fixed to the anterior vaginal wall. In one of the cases two ligatures had been seen projecting through the bladder wall, but no calculi had been attached to them. In the other case, the ligature had been voided with the urine. He had seen Olshausen using catgut in Cæsarian sections. He introduced it under the peritoneum, so that when tied the knots were buried. Continuous suture was used for the peritoneum.

Dr. Miller related a case of cystic disease of the liver he had had under his care. Dr. Hector Cameron had given notes of this case to the Medico-Chirurgical Society last year. The lady was still alive, and in good health.

Dr. Tindal said he was surprised to hear sponges were so often left in the abdomen. He thought the publication of this case ought to be an incentive for the Fellows to bring forward their failures. He did not see why pressure forceps should not be used, as it was easy to know how many were in use.

Drs. Kerr and *Richmond* also spoke.

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The President asked how old the first case was? and *Dr. Cameron* replied 22 years. He said he had always been in the habit of using chromicised catgut sutures where practicable, and had found them answer admirably in the big operations he used to do when abroad.

Dr. Cameron, in his reply, spoke of the very great anxiety an operator always experienced lest anything should be left in the abdomen, and how difficult it was to get nurses to count sponges properly. In one of his Cæsarian sections a small bit of sponge had been left, and he had had to reopen the abdomen and remove it a few days later.

REVIEWS.

Diseases of the Spinal Cord. By BYROM BRAMWELL, M.D., F.R.C.P. Ed., Assistant Physician to the Edinburgh Royal Infirmary, &c. Third Edition. Edinburgh: Wm. F. Clay. 1895.

ORIGINALLY prepared as lectures to students, for the purposes of teaching, the same form has been preserved in publication.

This form of publication has much to recommend it, as permitting more freedom of expression and offering greater opportunity for insistence on special points which the writer may think it desirable to present under different aspects and relations, but it has apparently not seemed to Dr. Bramwell consistent with this plan to add bibliographical references; this we think is regrettable, as, although impossible in oral delivery in the class-room, it might very well have been carried out in preparing for the press. We think he has missed the opportunity of rendering his work of wider usefulness. The very freedom which the form of the "*lecture*" permits an author is to some men a danger, and it seems to us that Dr. Bramwell would have done well to have avoided the dangerous subject of *examinations*, and certainly he would have shown better taste had he suppressed his philippic against examiners, and especially the ungenerous references to their cramming; it is too like "playing to the gallery," and might have been reserved for the obscurity of the class-room: indeed, we had thought that this source of erudition was not alone known to those gentlemen, but was also known to some of the makers of books.

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The impression which the perusal of a considerable portion of the book makes is one of serious disappointment: the literary style is not good, the sentences often involved and the meaning obscure, while almost every page is burdened with parentheses which often do not help to elucidate; but, what is worse, the book is not free from grave error, as witness the following passage which occurs in the discussion of the *reaction of degeneration* "in health kathodal opening contraction (K.C.C.) is greater than anodal opening contraction (A.C.C.)."

This is, of course, a very grave error, and is enough to destroy all confidence in the book as a guide to be put in the hands of students. Of course it is evident enough to one who *knows* that this is merely a slip, but we must remember that the readers of a book of this kind are not likely to be already possessed of the needful information to make the correction, and the embarrassment of the unfortunate student who meets with such a stumbling block at the very threshold of his studies, will not be lessened because of the want of correspondence between the symbols and the written text, and we fear nothing but perplexity and confusion of idea can result. Such an error is inexcusable. The whole section devoted to the electrical exploration of nerve and muscle, indeed, is unsatisfactory. The addition of diagrams of the *motor points* would seem to us to be needful if the student is to carry out the explorations which the author recommends. In various parts of the book there is much obscure or inexact statement, such as when the author, in the section on the "*pathological physiology*" of *infantile paralysis*, figures nerve fibres in the lateral columns which convey to the motor cells in the anterior horns "voluntary-motor and controlling-reflex impulses." The meaning of the latter part of the sentence, to our thinking, can hardly be very obvious to a beginner. What is, of course, meant is that such fibrils conduct not only volitional impulses, but also that they convey, from higher centres, impulses which are not perceived in consciousness, but which hold the reflex centres in the cord in some check, or are inhibitory. Further, we submit it is at least an unusual, if not incorrect, mode of expression to speak of nerve fibres in the posterior roots which *conduct*, to those same motor cells, *the superficial reflexes;* while what of course is meant is that the posterior roots *convey stimuli* from the skin or other sensory surfaces, which result in the liberation of reflex movement. We are also of opinion that Dr. Bramwell has fallen into error when he applies to the *antero-lateral*

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descending tract the name *Gowers' tract*, which, so far as we know, is reserved for the *antero-lateral ascending;* indeed, if we understand Gowers aright, the former seems to have been described by Foster and named by him "*descending antero-lateral tract*" (Gowers, *Diseases of the Nervous System*, 1892, vol. i, p. 178). Inaccuracies of this kind should have been avoided; they greatly detract from the value of the book.

Sufficient attention has not been directed, as we think, to the interesting and important question of *spinal localization;* it is merely touched upon, and, we are of opinion, it would have been well to have brought the work of Thorburn, Heads, and others before the reader, and perhaps to have reproduced some of their diagrams of the relation of sensory distribution to spinal segmentation, and to have pointed out the bearing of the exact delimitation of sensory disturbances in this connection. No doubt this has been indicated in a sense, and even a table drawn up, after Dr. Allan Starr, which is on the lines indicated, but it fails to appeal to a student in the way a diagram would, and besides, it is worthless when the dorsal region of the cord is in question. We also think some notice should have been taken of the relation of the various *spinal segments* to the vertebral spines. We fail to see any mention of *extension* in dealing with compression myelitis. This we think unfortunate, as, although Dr. Bramwell expresses a personal preference for *support* by the poro-plastic jacket, there can be no doubt of the value of extension on the inclined plane in cases of compression due to Pott's curvature.

On the Relation of Diseases of the Spinal Cord to the Distribution and Lesions of the Spinal Blood-Vessels. By R. T. WILLIAMSON, M.D. Lond., M.R.C.P. London: H. K. Lewis. 1895.

THE relation of the changes found in the spinal cord in many of its diseases with respect to the distribution of the blood supply, and the share of the vessels as an etiological factor in the causation of these changes, have not received, at least in this country, the attention they would seem to merit, and this is the more curious since so much attention has been given to both in the study of the pathological anatomy of cerebral disease.

As Dr. Williamson says, doubtless cerebral affections are much more frequently the result of vascular disease than

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diseases of the spinal cord, still he is of opinion that disease of the vessels plays a much more frequent and important part in the causation of the latter than we have hitherto been in the habit of recognising.

The aim of the book is to show (1) how some, at least, of the diseases of the cord are related to the *distribution* of special vessels, and (2) their *dependence* on disease of those vessels.

The first part of the book deals at some length with the distribution and peculiarities of the spinal vessels, and the second with the localization of the diseases in the territories supplied by special vessels, and with the changes in the vessels themselves.

The book is the outcome of mostly personal observation, and although very modest in size, and not attempting to deal exhaustively with the subject, it is an important contribution thereon, and should further serve to call attention to a somewhat neglected subject.

It is a pity a little more care had not been bestowed on revision, so that some faulty modes of expression might have been corrected.

Lectures on Diseases of the Spinal Cord. By DR. PIERRE MARIE, Deputy-Professor at the Faculty of Medicine of Paris, Physician of the Hospitals; translated by MONTAGU LUBBOCK, M.D., F.R.C.P. Lond. London: The New Sydenham Society. 1895.

DR. PIERRE MARIE'S *Leçons* were published in 1892, and are already widely known and highly esteemed as a masterly exposition of the diseases of the spinal cord, and their selection for translation and publication by the New Sydenham Society is a well merited recognition of their importance, and will render them available to a still wider circle of readers. They have already been translated into German.

As the title indicates, they are in lecture form, and were originally delivered in the Faculty of Medicine in Paris, in 1891. They suggest M. Charcot's method of exposition, and afford very pleasant reading, the style being easy and graceful, and the manner of presentation interesting.

Of course there is no attempt to cover the whole field of disease of the spinal cord, the diseases considered being mostly the chronic degenerations, but those passed under review are discussed most fully, *tabes* especially being expounded in

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great detail, both as to its symptomatology and pathological anatomy.

Dr. Marie accords syphilis an outstanding place as an etiological factor in the causation of *tabes*, and hazards the opinion that it acts as a real organic poison towards the *nerve cells*—especially those of the ganglia of the posterior roots—setting up toxo-syphilitic processes *in them*, and he strenuously combats the opinion most commonly professed by neuro-pathologists that the disease is essentially a *primary systematic sclerosis of the posterior columns*. Indeed, according to Dr. Marie, it is impossible, in the present state of knowledge, to admit a *primary* sclerosis of any of the conducting paths in the cord.

In the causation of *insular sclerosis*, Dr. Marie assigns to the *infections* the first place, but syphilis finds no place among them, while, on the other hand, enteric fever is alleged as one of the most frequent antecedents, small-pox coming next. First promulgated by him in 1884, he is of opinion that subsequent observation has fully confirmed this view; this, however, does not accord with the experience in this city. The writer cannot recall having, in the investigation of the histories of such cases, ever obtained an account of a recent infectious ailment, nor are such cases observed in our fever hospitals; this may be because the patients pass out of observation too soon to allow of such developments. On the other hand, it is not uncommon to learn of some fall or accident as preceding the first symptoms which attracted notice.

The translation seems to be an excellent one, and the volume has been enriched by the compilation of a very full and valuable index. The figures are not specially good in the original, and they seem to have suffered from much use.

Various Forms of Hysterical or Functional Paralysis. By H. Charlton Bastian, M.A., M.D., F.R.S. London: H. K. Lewis. 1893.

The nucleus of this little volume was originally published in the *Lancet* in the form of four lectures, so that Dr. Bastian's views are already well known to the profession. We are entirely at one with him in the belief that "hysterical" and "functional" are not synonymous terms—the latter being rather of generic and the former of specific significance, and

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that both, when employed as diagnostic terms, indicate our ignorance rather than our knowledge.

Dr. Bastian is not one of those who speak of hysteria as simulating other diseases. He regards hysterical or functional paralysis as arising from some dynamic form of disturbance of the cerebral or spinal centres, gross lesions of which give rise to structural or organic disease. Hence, as he says, "the phenomena of mere functional disease should not be expected to differ in kind, but merely in degree from the forms of structural disease to which they are akin." Hence, also, as the difference is only one of degree, there must be great difficulty in diagnosing functional from structural lesions. "There are no absolute criteria by means of which the two classes of cases are to be discriminated. It was formerly thought, and is still commonly taught, that the occurrence of well-marked muscular atrophy, of bed sores, of incontinence of urine and of fæces, or of nystagmus, were sure evidences of the organic nature of the affection in the course of which they occurred. As a general rule this is fairly true, but exceptions occur so frequently as to make it unsafe to rely too much upon the presence of either of these phenomena as infallible guides whenever we have to deal with doubtful cases." Under these circumstances the author must have recourse to what, after all, are the old means of diagnosis:—

"1. As functional defects tend specially to affect particular regions of the brain and spinal cord, we have to consider whether the grouping of symptoms met with in the case before us is such as our clinical knowledge has taught us may be due to a defect in one or other of such regions.

"2. We have to consider whether the mode of onset, coupled with the patient's general state, together with his or her immediate and remote history and family history, taken as a whole, most strongly favours the notion that we have to do with a malady due to mere functional defect, or to the existence of some organic lesion."

Numerous cases are recorded in detail illustrative of the various forms of cerebral and spinal functional paralysis, all extremely interesting. They bear specially on the localization of the lesions. This endeavour on Dr. Bastian's part to define, as far as possible, the exact diagnosis of each individual case, and not to be content with the simple statement that a case is "functional," merits imitation. In various parts of the book he expresses opinions which are not perhaps generally accepted, but in favour of which he adduces much weighty argument and illustration. Whether in all cases of this kind he will convince the reader is of little moment; in all cases

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he will interest him, and we feel sure that all who have to deal with obscure nervous cases will derive instruction and aid from a perusal of this volume.

Abdominal Tumours and Abdominal Dropsy in Women. By JAMES OLIVER, M.D., F.R.S. Edin. London: J. & A. Churchill. 1895.

WHEN a surgeon produces a work on abdominal tumours we look to find, as one of its prominent features, a full description and discussion of the various forms of operative treatment of these tumours.

In a work on abdominal tumours by a physician, we do not expect to find this feature prominent. In its place we anticipate, as the outstanding feature, a full treatment of the questions of symptomatology and diagnosis.

From a pathologist dealing with the subject we expect a dissertation on the histology and histogenesis of these tumours.

Dr. Oliver styles himself physician. We have no personal knowledge of what he may be. From perusal of his work it is easy, by a process of exclusion, to dismiss the possibilities of his being pathologist or surgeon, and it is difficult to see why the same process should not apply to the idea of his being physician, despite the *ipse dixit* of the title-page.

So far as we can discover, the only object the author has attained is the publication of a number of reports of cases which he has seen, reports as pointless as they are lengthy. Beyond these reports there is little in the volume, and of what little there is, much is given in so confused a form as to be meaningless, while much is absolutely erroneous. For instance, the chapter on Malignant Disease of the Body of the Uterus opens with the following paragraph:—

"Sarcoma and the soft variety of cancer may so develop in the body of the uterus as to produce an abdominal tumour. The disease may originate in the mucous lining and form a more or less polypoid growth, or it may arise in the muscular substance and transform eventually the body of the uterus into a malignant mass. In the latter case the tumour grows as a rule somewhat rapidly, and may attain an enormous size; but in the former the disease proceeds usually more slowly, and it seldom happens that the cavity of the uterus becomes so distended as to form a large abdominal tumour, as the new growth, whether it be sarcomatous or carcinomatous, is invariably soft, and shows a marked disposition to break

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down." Can our readers determine whether all of this refers to sarcoma or to carcinoma, or, if not, how much refers to the one and how much to the other?

Again, the pathology and etiology of perityphlitis are given in these lines:—

"*Perityphlitis.*—This consists in inflammation of the cellular tissue located between the ascending colon and the iliac fascia, whereby a more or less distinct swelling arises in the neighbourhood of the cæcum. In the majority of cases the disturbance originates in the cæcum or ascending colon, and extends to the connective tissue, but it may by metastasis occur during typhus, septicæmia, or puerperal fever."

Were this paragraph in any way different from the rest of the work the reader might pause to ask, What about the vermiform appendix? Also, Why is this more or less mediæval, and long since exploded myth, "metastasis," thus thrust on us at this time of day? As the paragraph, however, is of a piece with the rest of the work, the reader will, we imagine, feel with us that the effort to elicit information had better be reserved for other authors and other volumes. If anything is required to confirm him in this opinion, it will be found in the subsequent paragraph on "Treatment" of perityphlitis:—"During the inflammatory stage *leech;* when, however, it is *evident that suppuration is taking place, poultice,* and *as soon as* matter is detected, open." That is all; and the italics are ours. Comment is superfluous, as is also the reproduction here of further quotations from the book. *Ex uno disce omnia.*

First Aid to the Injured and Management of the Sick. By E. J. Lawless, M.D., D.P.H. Edinburgh and London: Young J. Pentland.

This manual is intended primarily for the use of regimental ambulance corps, by whose members, we doubt not, it will be found of service.

The first part comprises, in addition to a series of lectures dealing with "first aid to the injured," a few chapters devoted to the exposition of "stretcher drill" and "waggon drill" according to the principles laid down for the training of the army medical staff corps.

The second, and the more distinctive part of the book, discusses the management of the sick and wounded in war. Written with care and accuracy, the book will amply repay perusal, not only by the regimental bearer, but by the civilian.

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

PHYSIOLOGY.

By WILLIAM SNODGRASS, M.A., M.B., C.M.

The Influence of the Force of Gravity on the Circulation of the Blood.—A paper by Leonard Hill, M.B., upon the influence of the force of gravity upon the circulation appears in the *Journal of Physiology* for 20th May, 1895, and the conclusions to which his experiments have led him are of great interest and importance from a medical point of view. A few of his results may be noted here:—The force of gravity is a cardinal factor in dealing with the circulation of the blood; compensation for hydrostatic effects of gravity in changes of position must be ascribed to the splanchnic vaso-motor mechanism; compensation varies in different animals, being most complete in upright animals and man; when the splanchnic vaso-constrictors are paralysed by injury or poisons such as chloroform, the influence of gravity becomes of vital importance, the feet-down position being dangerous from dilatation and filling of the abdominal veins, with a corresponding emptying of the heart and the cessation of cerebral circulation; that, while the heart is normal, the syncope due to the feet-down position is abolished by the horizontal or feet-up position, or by firm pressure upon the abdominal veins, as by bandaging of the abdomen; that if the heart is affected, as by chloroform poisoning, the restoration of pressure is incomplete, and the heart may be stopped altogether by the inrush of a large quantity of blood; that vagus inhibition and cardiac acceleration are subsidiary compensatory mechanisms; that chloroform rapidly paralyses the vaso-motor mechanism and damages the heart, but that ether does so only very slowly and when pushed deeply; that the vaso-motor paralysis induced by chloroform persists for some time after removal of the anæsthetic, but can be compensated for by compression or elevation of the abdomen.

He finds, moreover, that the feet-down position inhibits *respiration*, and the feet-up position accelerates it—results abolished by dividing the vagi; that in the feet-down position the respiration is thoracic in type, in the feet-up position diaphragmatic, and that these types of respiration tend to compensate for the effects of gravity on the circulation, for the retraction of the abdomen in the feet-down position mechanically supports the abdominal veins, whilst the thoracic inspirations aspirate blood into the heart. In the feet-up position the full and free expansion of the abdomen withdraws all obstacles to the compensatory dilatation of the abdominal veins.

These results give a physiological basis for, and point to, the necessity in cases of syncope, shock, hæmorrhage, and chloroform poisoning, of maintaining the cerebral circulation, and filling the heart by elevating or strapping the abdomen.

The Normal Absorption of Fat, and the Effect of Extirpation of the Pancreas on it.—Dr. Vaughan Harley has investigated this question experimentally, and gives the following summary of his results in the *Journal of Physiology* for May, 1895:—

1. Normally a dog absorbs from 9 to 21 per cent of the total fat given in three to four hours, from 21 to 46 per cent in seven hours, and 86 per cent in eighteen hours.

2. In a normal dog the passage of fat from the stomach varies with the individual as well as with the time allowed for digestion. In three to four

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hours 25 to 44 per cent of the fat given has left it, in seven hours 33 to 63 per cent, while in eighteen hours the total has entered the intestines.

3. In normal dogs, of the fat that has actually entered the intestines, and therefore is under favourable circumstances for absorption, 37 to 76 per cent is absorbed in three to four hours, 65 to 86 per cent in seven hours, while 86 per cent is absorbed in eighteen hours.

4. In dogs which have had the pancreas removed the quantity of fat given is not only again recovered, but a surplus is found, which is probably derived from the intestinal secretion or excretion.

5. The passage of fat from the stomach is very much delayed by the extirpation of the pancreas, such dogs only passing in four to six hours from 3 to 10 per cent of the fat given into the intestines, while in seven hours only 9 to 22 per cent has traversed the pylorus.

Innervation of the Thoracic Duct.—The mechanism of the formation and flow of lymph has received much attention from physiologists of late, as it has become evident that vital, as distinguished from purely physical processes, are probably concerned in this function. MM. L. Camus and E. Gley have investigated the innervation of the thoracic duct, and give their conclusions in *Archiv. de Physiolog. Norm. et Patholog.*, April, 1895. Experiments show that the thoracic duct receives from the sympathetic chain both constrictor and dilator nerves. On excitation of the sympathetic trunk, as a rule, the dilation effect becomes visible; the constrictors are much less numerous, or are less excitable; sensory excitations, as a rule, produce reflex dilatation, while asphyxia acts at first on the constrictors.

The flow of lymph is due in the main to two great causes—(1) the *vis a tergo* due to the incessant production of the lymph (a force of propulsion acting at the extremities of the lymphatic system); (2) vascular contractility, governed like arterial contractility by the nervous system (a force acting at all points of the nervous system). Subsidiary aids to the flow of lymph exist in the influence of respiration, the pulsation of arteries, and the movements of the abdominal viscera and skeletal muscles.

Action of the Nervous System on Glycoso-formation.—To the *Archiv. de Physiolog. Norm. et Patholog.* for April, 1895, M. Kaufmann contributes four papers detailing the results of a prolonged and extensive investigation in regard to what he calls glycæmia, or the amount of carbo-hydrate, glucose, or glycogen in the blood. He considers more especially the parts played by the liver, pancreas, and general tissues in glycoso-formation, the modifying influences of one on the other, and their general subservience to the control of the nervous system. With regard to the latter point he finds that, under the influence of the nervous system, there may be an increase or decrease of the amount of carbohydrate in the blood—a hyperglycæmia or hypoglycæmia. Hyperglycæmic actions through the medium of the nervous system, as in puncture of the medulla oblongata, lead to excitation of secretory centres of the liver, inhibitory centres of the pancreas, and to excitation of tissue katabolism. Hypoglycæmic actions, as in section of the spinal cord at the level of the cervico-dorsal enlargement, exercise a precisely opposite effect. The centres of the former group—that is to say, those concerned in the production of hyperglycæmia—are situated in the bulb or the part of the cord between the third cervical vertebra and the bulb. Section of the cord above the third cervical vertebra determines hyperglycæmia, section lower down hypoglycæmia, the centres determining hypoglycæmia being situated apparently in front of the fifth cervical vertebra. The centres acting on the liver and pancreas send influences to the liver and pancreas through the splanchnic nerves. But over and above these higher centres there are intra-glandular nerve centres in the liver and pancreas which enable these glands to act independently of the central nerve centres. The bulbar and spinal centres act through these local centres by exciting or inhibiting their activity, and not directly on the glandular cells.

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SURGERY.

By HENRY RUTHERFURD, M.B.

Penetrating Wounds of the Thorax.—The first and essential point in the treatment of these conditions is to secure rest and immobilisation of the patient. The question of probing has been much discussed. Not only will the wise surgeon abstain from probing, but he will forbid the patient to be disturbed by percussion or auscultation of the chest. With the same object the patient is to be treated—that is to say, kept at rest where he has received his wound. He should not, for instance, be removed from one room to another, much less carried any distance to a hospital. He must be kept from talking, eating, or drinking. He should be enjoined to avoid coughing or clearing his throat. If necessary, he must be soothed with opium.

2. The condition of faintness is to be treated with respect. Within certain limits it favours the cessation or avoidance of bleeding. Alcohol or ether are only to be used on extreme and urgent indications, and in presence of these it is better to have recourse to caffeine and hypodermic injections of artificial serum.

3. Bandaging of the chest is useful as promoting comfort and fixation. The use of cold applications is secondary.

4. External bleeding is to be stopped, and the wound closed by an antiseptic compress.

5. As to hæmothorax from injury to a large vessel, there is, as a rule, no urgency. "Armed expectancy" must be the rule.

6. A protest is made against the practice which obtains among duelling societies of dressing up the wounded man, and making him look his best for visitors.

A number of interesting cases are given of recovery and of death after sword thrusts involving the lung.—(Huguet and Peraire, *Rev. de Chirurgie*, January, 1895.)

The Lembert Suture in Resection of Bowel.—Bier reports 15 operations (personal) in 14 patients, with 2 deaths, neither of which seems attributable to the failure of the suture. Of 5 cases of gangrenous hernia only 1 died. On the question of primary or secondary resection in these cases, he distinguishes two sets of cases, but inclines with Riedel to make an artificial anus in the first instance, and to do the resection in the course of a day or two. By this means the patient cannot be said to be exposed to the risk of inanition. Patient and bowel have time to recover from the immediate results of the strangulation; or in the hopeless cases, where peritonitis is already in existence, it has become plain that nothing more can be done. In cases of obviously gangrenous bowel the opening is freely notched, and the bowel brought well out and opened. When this condition is doubtful the bowel is fixed at the opening, and surrounded with iodoform gauze after all constriction has been relieved.

Only in one case of internal strangulation was primary resection done, because the adjoining bowel, which could be freely examined, showed itself free from any alteration of the circulation, and the man was in good condition. Just as in gangrenous hernia, so in other conditions of ileus the resection is to be secondary. Should the patient not survive, it may be presumed that he would not have survived the more severe operation.

He corroborates Riedel in the statement that the second stage can be carried out without narcosis. The patient does not suffer when the fibrinous adhesions of bowel to abdominal wall are separated, and only complaining of discomfort when the mesentery is dragged upon. He uses Hagedorn's needles, and moderately thick silk. Fine round needles cannot be placed so exactly, and very fine silk is difficult to work with. He insists on getting a good hold of the submucosa.—(*Langenbeck's Archiv*, Bd. 49, Hft. 4.)

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Toxic Effects of Glycerine.—Schillenberg, at the instigation of Mickulicz, reports upon 8 cases in which toxic symptoms, apparently due to the action of glycerine, have followed the injection of iodoform suspended in glycerine. Experiments on dogs and rabbits had already shown subcutaneous injections of glycerine to be followed by nervous symptoms, paralysis of muscles, tetanus, and hæmaturia. That it has a direct destructive action on the red blood corpuscles seems well established on the authority of several observers.

Of the 8 cases, 6 were in children. The only fatal case was that of a child of 4 years with tubercular coxitis. It was estimated that 60 to 65 grammes of the fluid (10 per cent iodoform in glycerine) remained in the cavity after suture. On the afternoon of the same day patient is noted to have been rather badly collapsed, and vomiting frequently in the evening. The urine contains albumen, blood colouring matter, shrivelled red blood corpuscles in large numbers, and tube-casts. He died on the fifth day.

Mild symptoms in the child were observed in one case after 10 c.c. of the emulsion, and severe symptoms in another after 15 c.c. One child escaped with severe symptoms after the reception of 80 c.c. Absorption is no doubt related to the nature of the cavity wall. In a chronic abscess with unscraped walls we would seem to have the safest type, whereas it is otherwise in a joint cavity.

In the case of pure iodoform, previous experience points to larger doses as necessary to produce symptoms—over 10 grammes; in grave cases, 60 to 100 grammes. Further, the signs of renal irritation may be considered as characteristic of the glycerine cases. It is to be admitted that the mischief set up in the kidneys may well interfere with the excretion of iodine, and thus intensify the symptoms of iodine intoxication.—(*Langenbeck's Archiv*, Bd. 49, Hft. 2.)

Gangrene of the Fingers from Carbolic Acid Dressings.—Laugier reports three cases in which gangrene of a digit was caused by prolonged wrapping up in a carbolic dressing. One of the patients made use of a 1 per cent solution of phenate of sodium; the other two employed carbolic acid solution of the strength of 1 in 50. None of the three had presented any predisposition to gangrene.

It is, therefore, evident that prolonged contact with a dressing saturated with a 2 per cent, or even 1 per cent, carbolic solution may give rise to a caustic action so strong as to result in partial or total gangrene of the part. This may occur at any age, in either sex, and apart altogether from albuminuria, diabetes, alcoholism, or endarteritis.

The writer remarks that these facts ought to be known by pharmacists as well as by medical men, and he would recommend druggists never to dispense carbolic solutions of a greater strength than 1 in 1,000 or 2,000, unless to a doctor's prescription.—(*Gazette Méd. de Paris*, 12th January, 1895.)—T. K. M.

DISEASES OF THE EYE.

By FREELAND FERGUS, M.D.

Lachrymal Probes.—Of the minor ailments of the eye, probably none is more annoying, alike to the patient and the surgeon, than chronic obstruction of the lachrymal passages. Some considerable time ago we called attention, in the pages of the *Glasgow Medical Journal*, to the paper of Dr. Theobald, which appeared in *Knapp's Archives*. In that paper the author advocated the use of probes about 3 or 4 mm. in diameter, saying that such probes alone were capable of restoring the calibre of the passages. In a recent number of the *Ophthalmic Review* Mr. Snell also advocates the

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use of large probes. By their use, he says, a large number of cases are cured entirely and many others greatly relieved. Mr. Snell, like all others who use large probes, slits the canaliculus. Unfortunately, however, he does not state as to which one he slits. Many surgeons, we fear, still adhere to the exceedingly bad habit of slitting the lower without first attempting the upper. The best probes that we have yet seen are the beautifully modelled silver probes of Snellen. Like all good modern probes, these are bent to the form of the lachrymal passages, and their introduction is generally very easily obtained. The old straight probe was always more difficult of introduction, and produced greater laceration of the tissues; hence modern surgeons have almost entirely discarded it.

Removal of Powder Grains from the Cornea and Skin.—*La pratique des Anglais* is a phrase which is often heard on the other side of the Straits of Dover. However considerable a quantity it may be, it will, perhaps, compare not altogether favourably with that of Brother Jonathan. That worthy, in the person of Dr. Jackson of Philadelphia, has lately proposed to remove grains of powder and charcoal embedded in the cornea by the simple process of destroying them with a fine white-hot cautery point. The thing seems simple enough, but somehow was never suggested before. The explosion of gunpowder generally leaves a residuum of charcoal, the minute grains of which get fixed in the tissues. He says, "The problem presented to the surgeon is not the removal of embedded masses, but of microscopic particles diffused through limited portions of tissue. Some realisation of this has led to the trial of blistering the part or washing it with a powerful spray." Such treatment, however, is not applicable to the eye, and hence Dr. Jackson has had recourse to the cautery, which he has used for the last three years. Regarding results, he says, "The resulting scars, even when thickly placed, cause a disfigurement quite insignificant in comparison with that left by the original injury, and one that becomes less and less noticeable with time, instead of increasing with the gradual wider diffusion of the particles of carbon."

Striated Affections of the Retina. By Ward A. Holden, in *Knapp's Archives.*—In this paper the author points out that there are three varieties of striation. The first appears as bands of a bluish membrane, the so-called retinitis proliferans. The origin of this form is traumatic or idiopathic hæmorrhage, which results in a proliferation in Müller's fibres, with the formation of connective tissue. The second variety appears as a number of narrow, branched, brown stripes beneath the vessels of the retina. These extend from the periphery to the disc. In the third variety, narrow yellowish-white striæ are found beneath the vessels. These are often bordered by a line of dark pigment, and generally extend from the periphery to the disc.

The object of the paper is to suggest that all these affections are due to hæmorrhage. The author says, "It would, therefore, seem warrantable to assume as a hypothesis, to be verified by future observation, that the affection called retinitis striata, like that called angioid streaks, arises through the elements of peripheric hæmorrhages being diffused in a linear manner in the deeper layers of the retina and undergoing various sorts of metamorphosis."

The arrangement of the blood he believes to be due to lymph channels in the retina.

Outflow Channels and Artificial Glaucoma.—Max Knies, in *Knapp's Archiv.*, has recently given a long account of numerous experiments on this interesting subject. In his experiments he has shown, what is already recognised by all, that the chief outlet for the fluids contained in the eye is by what is now popularly termed the filtration angle. To a less extent he believes that there is filtration through the membrane of Descemet into the subconjunctival tissue. Taking as an indisputable fact that the bulk of the fluid which passes from the eye does so by the filtration angle, he would

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explain glaucoma by assuming that sometimes this fluid is of a nature to cause inflammation at the base of the iris, in fact, in the spaces of Fontana, which are thus occluded, and hence the glaucoma—in other words, that there is sometimes present in the fluid an element which acts injuriously on the tissues in question. As to what this element is he is quite silent, but it seems quite possible that the high tension which occurs in hypopion ulcer may be due to such conditions. It must be admitted, and that freely, that many exceptional cases of glaucoma can best be explained on his hypothesis. Still, to us, his theory fails, in so far as it does not explain the circumstances that ordinary glaucoma is a disease of middle life, and that it occurs in eyes which, for the most part, are undersized and hypermetropic. Our author gives no reasons to explain why these eyes should be troubled by this element. In one point he is undoubtedly right. Any attempt to explain glaucoma on a neurotic basis must be futile. In our student days that was the only view held, or, at any rate, it was the view generally received. We well remember the contemptuous way in which Mr. Priestley Smith's first book was spoken of; still to us, even then, it brought a flood of light, and we venture to think that Mr. Priestley Smith's theory will explain many cases of glaucoma which that of Knies leaves unaccounted for.

GYNÆCOLOGY AND OBSTETRICS.

By E. H. LAWRENCE OLIPHANT, M.D.

The Cause of Puerperal Eclampsia. — In the *Monatsch. f. Geburtshülfe und Gynäkologie* for May there are two interesting papers on this question. Ludwig and Lavor give the results of several experiments, and review the advances made in the study of the subject since Lever, in 1843, advanced the theory that eclampsia was a form of uræmia, a view which was adopted by Frerichs (1851) and Spiegelberg (1882). But cases occur without albuminuria and without renal lesions; and, on the other hand, various lesions of the kidneys are found in cases where it does not occur. In 1887 Bouchard's researches on the urine opened the way for new views. Rivière (1888) was led thereby to assign eclampsia a special position among auto-intoxications, referring to the lesions found in the liver, lungs, and bowel, which are not less frequent than renal lesions. The urine of uræmic patients he found not more poisonous than normal urine, and its toxicity in uræmic convulsions was very slight. He thinks that the kidneys in pregnancy are relatively insufficient, and that the passage of large quantities of toxic substances may be the cause of renal lesion. Blanc (1890) tested Rivière's theory experimentally. He found the toxicity of non-albuminous urine in the late months of pregnancy and first five days of the puerperium averaged 76 c.c. per kilo. Bouchard had found the toxicity of urine to be 45 c.c. per kilo. Accordingly he infers that the pregnant woman neither forms nor excretes more toxic substances than normal. In the puerperium the toxicity was increased to 50 c.c. per kilo. Laulanié and Chambrelent (1890), with the same experimental results, came to the opposite conclusion from Blanc—viz., that the toxicity of the urine being diminished, the organism is loaded with toxic substances. Tarnier (1890) found the urine in the last three months of pregnancy less toxic than normal; and Chambrelent and Démont (1892) confirmed this. Goria (1892) found the urine after delivery more toxic than before it. Rummo (1891) determined the toxicity of normal human blood serum at 10 c.c. per kilo. Ludwig and Lavor find that of normal parturients at between 8 and 9 c.c. per kilo., and that of eclamptics at under 6 c.c. Chambrelent also (1890) determined the toxicity of serum in eclampsia as greater than normal, while the urine in eclampsia is three times less toxic than in the normal parturient. From these results comes the theory that eclampsia

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is an auto-intoxication by products that should be excreted in the urine. This auto-intoxication arises from the collection of toxic substances in the pregnant organism, due either to disease of the kidneys (eclampsia with albuminuria) or to relative insufficiency of the kidneys (eclampsia without albuminuria) and lesions of other secreting organs (liver, skin, bowel, lung).

From the experiments of Ludwig and Lavor it was evident that the toxicity of eclamptic *urine* was subject to great variation, even in the same case, within a few days; but during the convulsive stage an *increase* of toxicity was never observed, while mostly there was marked *decrease*. In the hours and days following the convulsion, however, there was increase. On the other hand, the *serum* of the convulsive stage was far more poisonous than the normal serum of parturients, and had a specific effect on the kidneys (producing hæmoglobinuria) which normal blood serum has not. In questioning as to the nature of the toxic agent, reference is made as to the results of Eck's operation of leading the blood directly from the digestive canal into the vena cava, and so excluding the liver from the circulation. This gradually brings on convulsions and coma resembling eclampsia. In the urine of the animals experimented on, carbonic acid is found; and when this is introduced into the stomach of healthy animals, it is rendered harmless by the action of the liver. Ludwig and Lavor thus sum up the conclusions to which they arrive:—"We regard eclampsia as an auto-intoxication with a rapidly decomposing urinary constituent, which, being a product of uncompleted metabolism, accumulates in the organism during pregnancy, owing to disturbances in assimilation; and its effect during labour, and in the puerperium in cases of functional disturbance of liver and kidneys, takes the form of eclamptic convulsions. Its excretion rapidly follows the convulsive stage, and takes place through the kidneys. Whether this toxic substance owes its origin solely to the lesions of the liver so constant in eclampsia, and whether it represents a constituent in the synthesis of urea, or is carbonic acid itself, we leave to farther researches."

Schreiber, in discussing "the present position of the question as to the origin of eclampsia," goes over very much the same ground as Ludwig and Lavor; but, in addition, refers to the possible infectious nature of eclampsia. In its onset it resembles infectious diseases, and many investigations have been made with a view to discover a "bacillus eclampsia," but, as yet, without result. The toxic character of the blood serum may be due to ptomaines (the product of the action of microbe) or to leucomaines (the product of the action of the tissue cells). If it is due to ptomaines, then it is an infectious disease (like tetanus, for which a bacillus has been found), and some instances of a series of cases suggesting infection have been actually reported.—J. K. K.

Entanglements and Shortening of the Umbilical Cord.—Dr. M'Gillicuddy read a paper on this subject before the New York Academy of Medicine, reported in the *New York Medical Journal*, April, 1895. In about 25 per cent of all labours, the cord is either bound round the child's neck or is in some other anomalous condition. Suicidium fœtus in utero is often referred to by the older writers as being of common occurrence, and there can be little doubt that it is not rare. Dr. M'Gillicuddy had, within a comparatively short time, seen a number of specimens illustrating this complication of pregnancy. It is a pathological condition, due to the movements of the fœtus, by which the cord is so tightly twisted round the neck, body, or extremities as to shut off the blood supply, and thus cause its death. The paper is illustrated by drawings of the specimens described. The first two cases were thrown off early in pregnancy, strangled by the cord tightly wound round the neck, causing cord and neck to be atrophied. The next two were at full time, but were still-born, death here again being ascribed to the twisting of the cord tightly round the neck. The seventh case was published *in extenso* in 1893, and is interesting from an obstetric point of view. The mother was a primipara, aged 28 years; labour lasted six hours only. Just at the final moment of delivery there was a severe pain, and the placenta, which was said to be firmly adherent to the uterus, was found along with the inverted uterus

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in the vagina. Hæmorrhage was very profuse. In this case the cord was wound round the child's neck, wrist, and body. Dr. M'Gillicuddy also records two cases reported by friends. In one, by Dr. O'Brien, a vaginal examination of the mother showed the fœtus to be lying in an abdominal anterior position, with hand, foot, and cord presenting at once. During the examination there was a sudden snap, with a gush of blood, showing that the umbilical cord had ruptured. Delivery was effected by pelvic version, and the life of the child was saved by immediate arrest of the hæmorrhage, which was successfully accomplished by transfixing the stump of the cord with a needle, and then ligaturing. In the other case, Dr. Marx delivered a fœtus of six months with the cord tightly round the neck, and separated at the placental attachment. In a case quoted from the *Edinburgh Obstetrical Transactions*, the cord was twisted tightly and knotted tightly. The part of the cord from the umbilicus to the twist was round and large; the part from the twist to the placenta was small and shrivelled. In another case, the child was cut almost in two by coiling of the cord round the abdomen. Dr. M'Gillicuddy draws attention to the marks caused on the child's neck by the tight cord, and notes the medico-legal importance of keeping this in mind. Obstetrically, the short cord is of importance in causing inversion, as in the case already quoted; and to this condition Dr. M'Gillicuddy also ascribes many cases of accidental hæmorrhage. Excessive coiling about the neck may prevent flexion of the head. Delay from the child being simply held back by a coiled or short cord is also described, but the treatment is not satisfactory. Dr. M'Gillicuddy advocates placing the woman in a sitting or squatting posture, as in this position the abdominal tension is increased, as in defæcation, and the action of gravity brings the uterus farther down. In one of the cases the patient felt a dragging sensation in the umbilical region whenever she raised her hands, and attributed this to the cord being round the child's neck. Dr. M'Gillicuddy says the mother's apprehension was founded on what he calls a plausible theory: that when the mother performs certain movements, the child performs the same movements, and that it is a firmly rooted belief among many of the knowing old women that pregnant women should not reach upwards lest they cause entanglement of the cord. Most popular notions, no matter how fantastic, are often founded on a certain amount of fact.

Books, Pamphlets, &c., Received.

The Lumleian Lectures on the Etiology of Disease, to which is added the Harveian Oration for 1893, by P. H. Pye-Smith, M.D., F.R.S. London: J. & A. Churchill. 1895. (7s. 6d.)

The Eye in its Relation to Health, by Chalmer Prentice, M.D. Bristol: John Wright & Co. 1895. (6s. 6d.)

Atlas of Clinical Medicine, by Byrom Bramwell, M.D. Vol. III, Part II. Edinburgh: T. & A. Constable. 1895.

Myxœdema and the Thyroid Gland, by John D. Gimlette, F.R.C.S. Eng. London: J. & A. Churchill. 1895. (5s.)

The Treatment and Education of Mentally Feeble Children, by Fletcher Beech, M.B. London: J. & A. Churchill. 1895. (1s. 6d.)

Diphtheria and its Associates, by Lennox Browne, F.R.C.S. Ed. London: Baillière, Tindall & Cox. 1895.

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THE

GLASGOW MEDICAL JOURNAL.

No. II. AUGUST, 1895.

ORIGINAL ARTICLES.

CLINICAL MEMORANDA,

BEING SELECTED CASES FROM THE WARDS OF

DR. M'CALL ANDERSON,
Professor of Clinical Medicine in the University of Glasgow.

(REPORTED BY W. ERNEST THOMSON, M.D.)

XV.

31. *Syphilitic Disease of the Spinal Cord.*

T. M'G., aged 40, labourer, was admitted into Ward II on the 19th April, 1895, complaining of general weakness, but more especially of the legs, and of pain in the epigastric region; symptoms of about fourteen days' duration.

The family and personal histories are both good, and the patient denies having had any venereal disease.

His occupation before the onset of this attack, was an exceptionally trying one. Employed in the hothouses at the Botanic Gardens, he was frequently called upon to leave his work and to attend to something out of doors, and this during the severest period of the frost of last winter. He was then transferred to carting work, and often, at 5 A.M. was

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all but frozen. Afterwards, when the weather was still cold, though not intensely so, he was sent back to the hothouse job, and a few days later, or twenty days before admission, began to experience at times a numbness of the left foot.

About a fortnight before admission, or a week after the first symptom, he observed that he was losing flesh and strength, and that his gait had become unsteady. He had also lost appetite and felt generally ill. Eventually he had to stop work and applied for admission to the Infirmary.

The following report of his condition was then made:—

The patient is very thin, the legs indeed are emaciated, a fact which is emphasised by the prominence of the bony points about the knees, and by the hollows below the tibial tuberosities. The whole muscular system seems soft, and the dynamometer registers only 28 and 30 kg. in the right and left hands respectively. There are pigmented scars on the chest, fore-arms, and legs.

There is paresis of the lower extremities, especially of the left. When walking the gait is feeble, but not at all ataxic; he takes short steps, and brings the whole foot down on the floor at once. When questioned regarding his walk, he says he would be all right but for the *weakness* of the legs. There is no stiffness or tremor.

Equilibration with the eyes shut and feet together is almost normal, but there is a slight tendency to fall backwards; and, when walking, he turns with some difficulty.

Sensation is slightly defective in both legs, and there is analgesia, but the left is distinctly more affected than the right. Sensations of heat and cold are practically normal.

The deep reflexes are affected:—

Right patellar reflex is defective; left patellar reflex is exaggerated; right ankle, no clonus; left ankle, clonus obtained with difficulty.

The right optic disc is intensely hyperæmic, the left is almost in a condition of neuritis; but there is very little prominence of the papilla in either eye.

The functions of the bladder and rectum are normal. There is no cord-like sensation. The heart sounds are feeble, but no murmur can be detected; there is some tenderness in the epigastrium on palpation, and increased aortic pulsation is felt, but no murmur can be heard. The other organs are normal.

The treatment at first adopted consisted in absolute rest in bed, and regulation of the bowels; and a mixture containing iodide of potassium and liquor strychninæ was ordered.

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No very manifest improvement took place, and it was deemed advisable to resort to mercurial inunction in the hope that the pigmented scars, observed in various situations, were indicative of syphilis, and that the symptoms might yield to antisyphilitic treatment. Improvement set in, though slowly. The knee-jerks became more normal, and the tendency to ankle clonus gradually disappeared. The principal change, however, was in the patient's own sensations of returning activity, better appetite, and improved general health. Sensation in the legs became nearly perfect.

He was dismissed on 14th June, walking almost normally, the left leg feeling a little weaker than the right. He could walk a plank without much difficulty, and could turn round smartly. The optic nerves were still hyperæmic, but the outlines of the discs could be made out fairly well. His appetite was good, and he expressed himself as greatly benefited by his stay in hospital.

32. *Syphilitic Disease of the Eyes, &c.*

Mrs. S., aged 34, was admitted to Ward IV on 13th February, 1895, with two sores on the forehead, between the eyebrows, of seven months' duration, and an affection of the left eye.

Her father died at 56, of asthma; her mother and family are alive and in good health. She herself has had five children, two of whom died at 4 and at 3 years old respectively.

There is nothing in the history obtained to give a clue to the cause of the present trouble, except that she had a sore throat about twelve years ago. In fact, there seemed to be nothing pointing in the least degree definitely to syphilis.

The affection of the brow began seven months ago as two red spots which felt very hot. In about a month they became prominent, and crusts formed which were removed and outlet given to a quantity of pus. In another month they had apparently healed, but broke out again shortly afterwards. They have never been painful unless injured by a blow. She feels quite well generally, and states that she knows no cause for the disease.

The characters of the affected part were as follows:—

Between the eyebrows, towards the right side, there are two rounded sores which contain sloughs in the centre. The edges are raised and red, and the redness extends down towards the root of the nose.

Examination of the eyes revealed the fact that there was keratitis with diffuse corneal opacities and slight circumcorneal

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injection of the left eye, with greatly diminished visual acuity. No complaint was made regarding the right eye.

After due consideration of the history and the symptoms the suspicion was that the disease was tubercular in nature, and treatment was accordingly directed towards improvement of the general health. She was ordered to take cod liver oil in increasing doses up to three ounces daily. Appropriate treatment was ordered for local application to the eye. The crusts were removed from the sore on the brow and acid nitrate of mercury applied.

Practically, no improvement took place either in the condition of the sore or of the eye, which latter indeed steadily grew worse.

On 28th April she complained that for the last ten days she had been troubled by seeing dark spots dancing before the *right* eye. Ophthalmoscopic examination of this eye revealed neuro-retinitis with a large patch of effusion extending from the outer edge of the disc to near the macula. Examination of the left fundus was impossible owing to the density of the corneal opacity.

It should also be mentioned that on 10th April the patient had an acute middle ear affection for which she was treated by Dr. Barr.

It began now to be a question whether the diagnosis had been correct, and in view of the failure of treatment it seemed advisable to try the effect of antisyphilitic in place of antistrumous remedies; when, by the merest accident, it was ascertained, in the course of a chance conversation with the patient's former medical attendant, that he had, about thirteen years previously, treated her for acquired syphilis with mercury and iodide of potassium.

Treatment by inunction with mercurial ointment was immediately commenced, and almost immediately marked improvement took place. By 13th June, the sore on the brow had almost healed; the keratitis in the left eye had subsided leaving only a faint nebulous opacity; and the neuritis in the right eye was passing off, though leaving, as might be expected, a somewhat atrophic condition behind it. She left on 19th June, the eyesight being almost completely restored.

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STRANGULATED FEMORAL HERNIA ON RIGHT SIDE —GANGRENE; RUPTURE; RESECTION OF THE BOWEL; CURE.[1]

BY DAVID NEWMAN, M.D.,
Surgeon to the Royal Infirmary.

MRS. M'C., aged 44, was admitted into the Glasgow Royal Infirmary at a quarter before 12 P.M. on the 5th April, 1893, complaining of symptoms of strangulated hernia of three days' duration.

When I first examined the patient, I came to the conclusion that she was suffering from some form of acute intestinal obstruction, but there were two points of difficulty which required to be considered. On examining the various regions where hernia was likely to occur, the only positive fact I could discover was a swelling over the right femoral opening. This swelling was rounded, hard, freely movable, and dull on percussion; and I came to the conclusion that it was an enlarged lymphatic gland. Whether or not there was a hernia behind it was extremely difficult to say; I therefore gave the patient a large enema of castor oil and soapy water, with the result that the bowels were freely moved, and the suffering of the patient considerably relieved. The pain was diminished and, for the time being, the vomiting, which was previously severe and persistent but not stercoraceous, ceased; the pulse, also, which had been very feeble, improved; and the patient said spontaneously that she was much better. The fact that the bowels were relieved by an enema, and the circumstance that no hernia was actually found, led me to delay operating. But the following morning (6th April) I found that the pain and vomiting had recurred. The vomited matter was now stercoraceous in character and copious in amount, while the pain had returned as severe as before. The pulse was now very weak and thready; the respirations rapid; and the temperature 98° F. The prostration was very marked; the face was pinched and sallow; and the whole aspect of the patient was that so often seen in cases of strangulated hernia. I therefore determined to make an incision over the right femoral opening. I dissected out the enlarged gland just referred to, and behind it I found a small femoral hernia.

[1] This case was shown to the Glasgow Pathological and Clinical Society on 8th April, 1895. The discussion upon it will appear in our next number.

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The sac of the hernia was gangrenous, and on opening it a quantity of fæcal matter escaped.

The question then arose—what should be done? Should we trust to nature, after making a free incision into the bowel, as recommended by Sir William Lawrence, or should we resect the bowel? At this stage of the operation I sent for my colleague, Mr. H. E. Clark, and he agreed with me that, considering the extremely weak condition of the patient, resection of the bowel was the only operation that would give her a chance of ultimate recovery.

In order to reach healthy intestine without contaminating the interior of the abdomen, I found it necessary to divide Poupart's ligament, and to draw down 6 or 8 inches of intestine on either side of the strangulated part. I then emptied the bowel upwards and downwards from the hernia, and applied Makin's clamps. It was found necessary to remove 4 inches of intestine in order to get two healthy segments to place in apposition. Along with the bowel a wedge-shaped portion of mesentery was removed, and the cut surfaces were carefully united with silk sutures. The mucous membrane of the two portions of bowel was then carefully sewn together, care being taken that the two *sub-mucous surfaces* (not the cut margins of the mucous membrane) were brought in apposition with one another. This was done by means of a figure of 8 stitch, which effectively prevented the possibility of the epithelial surfaces coming in contact with each other, and so preventing complete union. After the mucous coats had been thoroughly secured, the serous aspect of the bowel was united by Lembert's method, with slight modifications, to which it is not necessary here to refer.

When the bowel had been sutured satisfactorily, it and the surrounding parts were carefully washed with a copious flow of warm boracic acid solution. The gut was then reduced within the abdomen. The two cut margins of Poupart's ligament were brought together; the lips of the wound were united; and a drainage-tube inserted. The patient made a slow, but ultimately a very satisfactory recovery.

On account of persistent coughing, due to chronic bronchitis, some difficulty was experienced in keeping the bowel in position, and, added to this, the patient suffered greatly from chloroform sickness. Then, again, as a consequence of the gangrenous condition of the sac previous to the operation, a good deal of discharge occurred from the incision in the parietes, although every attempt was made at and after the operation to render the wound aseptic.

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The patient left the hospital (14th May, 1893) perfectly well, and was able to follow her occupation, that of a washerwoman, but, of course, she had to wear a truss when out of bed. When last seen (29th March, 1895) the patient said that she was quite well, and could do a good day's work without suffering in any way.

In cases of strangulated intestine, it is now recognised that it is the first object of the surgeon to return the bowel into the abdominal cavity as soon as possible; hence the operation of herniotomy is resorted to much earlier at the present time than in former days, but when the intestine becomes gangrenous, the operator is precluded from reducing the hernia. If the knuckle of bowel in the sac has become gangrenous previous to herniotomy, or has ruptured during the operation, the probability is that adhesions have previously formed between the coil of strangulated intestine and the parietal peritoneum, and that thereby a conservative process has become established, by which the cavity of the abdomen is shut off, and so extension of peritonitis beyond the vicinity of the hernia is prevented.

By some surgeons it is considered undesirable to interfere with this process of nature, unless the bowel is very easily reached. The recommendation of Sir William Lawrence[1] is usually carried out. He recommends that a gangrenous strangulated hernia should be treated by "a free incision through the mortified part, in order to unload the distended intestinal canal; or, if the gut should have already given way, to divide freely the integument and sac, and to leave the subsequent process of cure entirely to nature." He also advises that the margins of the wound should be left freely open, so as to permit of an easy flow of the contents of the intestine. In this way an artificial anus is established. In the event of the open end of the gut being easily accessible, several sutures may be inserted through the gut, so as to unite it to the parietes.

An interesting paper on the treatment of strangulated hernia, when the intestine is gangrenous or ulcerated, was read before the Royal Medical and Chirurgical Society of London, and published in the *Transactions* of the Society, vol. lxxiv, by C. B. Lockwood. His paper was based on the analysis of cases of hernia, in which the intestine was gangrenous or ulcerated, collected from the records of St. Bartholomew's Hospital; and he found that, of the cases treated in the manner laid down by Sir William Lawrence,

[1] *A Treatise on Ruptures* (fifth edition, 1868), p. 364.

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4 out of 35 recovered, 3 of them completely, while 1 had a fistula eight months after the operation. That is to say, the mortality of the St. Bartholomew's cases was 88·57 per cent, which is by no means a satisfactory result.

By those surgeons who practise the method advocated by Lawrence, it is presumed that the bowel is drained by means of the artificial opening.

Seven years ago I was called upon to operate upon a case (a female) of gangrenous strangulated femoral hernia, and followed the advice (that of Lawrence) then prescribed in most of our text-books, with the result that, for some days, comparatively little relief was given through the artificial anus, although its lumen was sufficient to admit my forefinger. It was only when a tube fully 6 inches in length was passed into the bowel that fæculent matter came away freely. This patient recovered, but with a permanent fistula.

Members of the Society who are interested in the comparison of the old and new methods of treating gangrenous intestine, will find an exhaustive review of the subject in *Deutsche Medicinische Wochenschrift*, 1888, p. 829, No. 41, by Dr. W. Cörte. He gives a list of 111 cases of anus prenaturalis treated with the enterotome; and of these 11 died. The mortality, after primary resection and sutures, is 71 per cent; and after artificial anus, 85·5 per cent.

In the *New York Medical Journal*, 1889, p. 285, M'Cosh tabulates 113 cases, of which half were successful, and Makins, in the *Münchener Medicinische Wochenschrift*, Nos. 5 and 6, 1889, tabulates 55 cases with 29 deaths.

I have gone into this subject carefully, and I am disposed to follow the practice adopted in the case which I have just brought before the Society—viz., performing primary resection of the bowel in cases of gangrenous strangulated hernia. No doubt secondary suture of the bowel is less fatal than primary resection, but it must be remembered that secondary resection is only performed in patients who have survived from a very fatal disease; and by waiting, the patient must necessarily run a double risk.

In cases of femoral hernia, I think it most important to divide Poupart's ligament, in order to have plenty of room to operate with freedom. It is seldom possible to accomplish the operation through the original wound, unless the gangrene is very limited in extent. When the whole lumen of the bowel is involved, as it was in my case, it is necessary to drag down the healthy intestine, so as to get well beyond the diseased tissues. This case might have been a suitable one

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for the employment of Murphy's buttons, but, as they were not to be had in this country at the time, I simply employed sutures. The suturing was very carefully done, and, as you see, the result is satisfactory.

A CASE OF TRANSPOSITION OF THE THORACIC AND ABDOMINAL VISCERA.[1]

BY JAMES P. BOYD, M.B., F.F.P.S.G.,
Assistant Physician to the Glasgow Royal Infirmary.

J. K., aged 19 years, residing in Glasgow, came to the Dispensary of the Royal Infirmary on 7th March, 1895, complaining of pain over the right side, and on examination he was found to be the subject of congenital visceral transposition.

He was born in Falkirk, and is one of a family of eleven, who are all living and well, with the exception of two who died in infancy.

His father tells me that, as far as he knows, no relatives either on his or the mother's side have ever been the subject of any abnormality.

Throughout life the boy's health has been uniformly good, save for a fall from a swing some ten years ago, when he evidently seems to have suffered from concussion of the brain.

Since infancy shortness of breath ensued after any undue exertion, but that it has never caused any special inconvenience is evidenced by the fact that he has always been able to join in every kind of sport as well as other boys.

From time to time for many years, in fact as far as his memory can carry him, he has suffered from pain in the right hypochonder, just below the costal margins of the ribs, and the pain he likens to that produced by a blow with the fist. The pain came on without any assignable cause and lasted several days, and would even sometimes necessitate his remaining in bed. He has rarely gone many months without the pain—for example, last year he had it about half a dozen times with an interval of freedom from pain of about two months between times. He is troubled a good deal with

[1] The notes of this case were read, and the patient shewn, at the Glasgow Medico-Chirurgical Society, 5th April, 1895.

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cough, but has no expectoration. He takes his food well, and in every way has good health.

He is a stunted but sturdily built muscular lad, looking younger considerably than 19 years. He is 4 feet 10 inches in height, and weighs in his clothes 7 st. 12 lb. He has a slight tendency to knock-knee. The thumb of his right hand is bifid from the metacarpo-phalangeal joint. Each possesses a nail, and in size and shape resemble one another, and move in unison.

He is *right-handed* at work and at games save when he plays marbles, when he gives his left hand the preference because the double thumb interferes with his play.

His chest is somewhat prominent at the junction of the ribs with the manubrium, and there is a tendency towards lateral curvature of the spine. The right side of the chest, measured at a point 2 inches below the nipple, exceeds that of the left by half an inch. His power of grasp, as tested by the dynamometer, shows the left to be rather the stronger.

If the photograph be studied the percussion dulness of the viscera will be seen at a glance. The various organs were percussed out and the skin marked deeply with blue pencil and then photographed.

The physical examination of the thoracic and abdominal organs will now be considered :—

1. *The Heart.*—The apex beat is visible and situated in the fifth right interspace within the nipple line. To percussion the upper border of the heart corresponds with the middle of the right third rib; the inner border to the right of midsternum ; and the outer border falls just within the nipple line. The transverse cardiac measurement is 4 inches.

The heart sounds are pure and regular, and there is no undue accentuation of either sounds.

2. *The Liver* occupies mainly the epigastric and left hypochondriac regions. Its upper border to percussion corresponds with the upper border of the fifth rib on the left side, and it measures at the midsternal line, 3½ inches ; at the nipple line, 4¼ inches; and in the axillary line, 5 inches.

3. *The Spleen* is situated in the right hypochondriacal region, and to percussion corresponds with the seventh, eighth, ninth, and tenth ribs. It measures in its oblique diameter, 3¼ inches.

4. *The Stomach.*—To determine its situation accurately the patient was given a small teaspoonful of bicarbonate of soda, followed by one of citric acid, the effervescing gas resulting distended the stomach, so that it was found to be occupying

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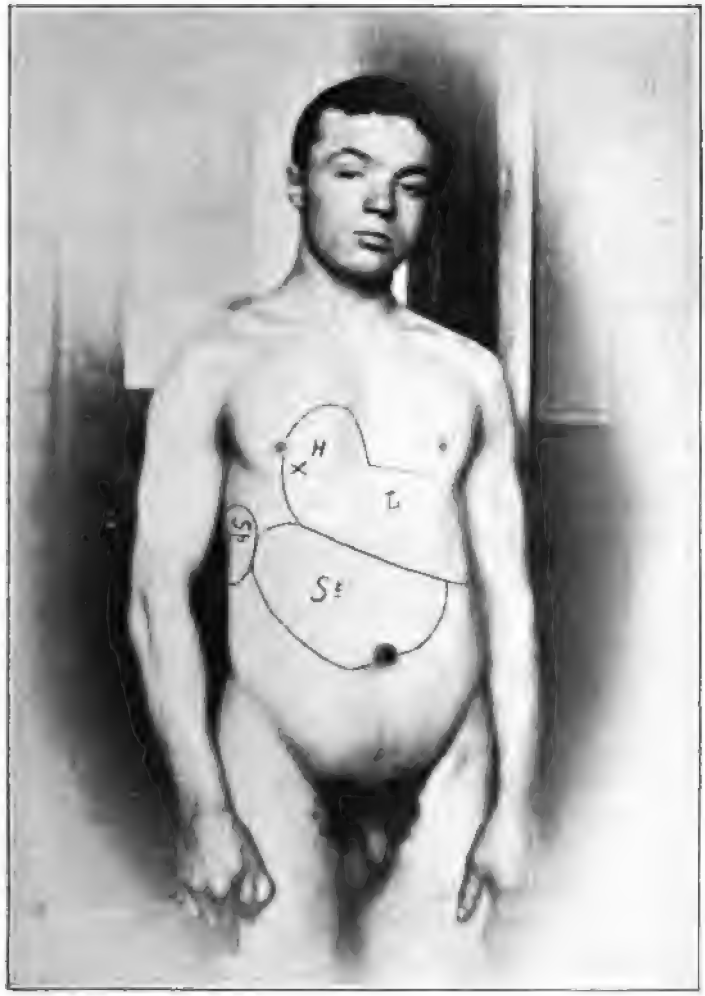

X corresponds with palpable apex beat.
H „ „ cardiac percussion dulness.
Sp „ „ splenic percussion dulness.
L „ „ liver percussion dulness.
St „ „ stomach tympanicity (dilated with gas).

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mainly the right hypochondriac and epigastric regions. The tympanitic stomach note allowed of its outline being roughly demarcated as seen in the photograph.

Remarks.—The literature on the subject is so extensive that it is impossible to compare my case with the innumerable number of cases of transposed viscera recorded in British and foreign medical literature. For convenience, I will refer simply to those reported from Scotland. Dr. Frazer, of Paisley, in the *Glasgow Medical Journal* of 1883, described the case of a middle-aged lady in whom there was transposition of heart, liver, stomach, and spleen, thus corresponding with the state of matters present in the boy. Dr. Frazer, of Edinburgh, reported a case in the *Edinburgh Medical Journal* of 1883, differing from the one I have described in that the stomach and spleen were alone transposed. Perhaps the most interesting case of all is the record of a dissection made by Professor Allen Thomson, and reported in the *Glasgow Medical Journal* for 1854. He found transposition of heart and liver, but the stomach and spleen were situated in the left hypochonder. The caput cæcum coli and ascending colon occupied the left side. It is of interest to note that Dr. Samson Gemmell was of opinion that the left iliac percussion note in J. K. yielded a resonance which resembled closely that usually present over the cæcum when in its normal situation on the right side.

In Dr. Allen Thomson's dissection the left lung was trilobed and the right bilobed, and the arch of the aorta passed over the right side of the trachea and gullet instead of the left. He discusses the mode of production of such malformations, and sums up his conclusions in the following words:—"That they probably arise from, or are connected with, some derangement in the position of the whole embryo at the period when the relation of organs are more immediately fixed by the course of their formation." Dr. Littlejohn, of Edinburgh, also reports a case in the *Edinburgh Medical Journal* for 1888.

As I have previously stated, my patient enjoys on the whole excellent health, being able to follow his occupation as a moulder without inconvenience. The pain which he occasionally suffers from in the right side seems to be entirely muscular, and in no way dependent on his malplaced viscera. From an insurance point of view, one would presume that his life would be accepted without any loading, but I do not suppose the question has ever arisen.

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A CASE OF MISSED ABORTION—RETENTION OF OVUM FOR EIGHTY-SIX DAYS AFTER DEATH OF FŒTUS.

BY JOHN A. ANDERSON, M.D., STRANRAER.

THE following case is of interest because it forms one of a class to which considerable attention has been recently[1] paid, under the title of "missed abortions." It has been thought right to put the case on record, not only because such cases are rare, but also because from the very clear clinical history, in part furnished by an intelligent patient, and in part consisting of observations on my own part, it is possible to relate the case with more accuracy than is generally obtainable in cases of this kind.

The history of the case extends from 26th July, 1893, till 17th February, 1894, and is supposed to have been written soon after the latter date.

Mrs. M., age 33, a woman of rather spare habit of body, but free from any constitutional taint—in particular, free from syphilis—has been eighteen and a half months married, and has had no children, but had an abortion at the end of the second month (in March, 1893). In due time the menses reappeared and recurred regularly, the date of commencement of the last period, prior to the impregnation of which this is the history, being 26th July of the same year. Soon after, the usual disorders of the gastro-intestinal canal, symptomatic of early pregnancy, showed themselves, and continued in full force up till 22nd November. On the evening of this date patient thought she had caught a chill, and during the night became feverish, while a hæmorrhagic discharge of a dark purple colour began to escape from the vagina. On examination *per vaginam* next morning, when I was called, the os was found closed; and, as uterine pains were completely absent, it was determined to try to avert the occurrence of abortion. For this purpose rest in bed was secured; the utmost care as to diet exercised, and opium given internally; and, it may be said, the details of treatment were carried out so satisfactorily as most probably to be responsible for the non-discharge of the ovum at this time. The hæmorrhage at once lessened and had almost completely ceased on

[1] *British Medical Journal*, 26th November, 1892; 7th January, 1893; 25th March, 1893; and 16th September, 1893.

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1st December, only the slightest blackish staining being visible on the napkin. Patient was allowed up for an hour on 3rd December, and in the course of a week more was going about in her usual way again. From this time I saw no more of her until 16th February, and in that interval presumed that her pregnancy was advancing normally. But on the date last mentioned I was again called, and, after enquiry, found that the dark coloured discharge had continued to escape from the vagina in very small quantity from 3rd December till the middle of January (six weeks), when it disappeared completely. It reappeared, however, in very small quantity on the morning of 16th February, owing most probably to some unwonted exertion on the previous day. I had an opportunity now of examining the napkin, and ascertained that the stains on it were not due to fresh blood. There were as yet no uterine pains. *Per vaginam*, the os was still closed. The lips of the os and the cervix, as compared with their condition on 23rd November, were harder, the softening formerly present being scarcely appreciable. The condition of the breasts had receded to what one would expect in the unimpregnated state; and, on questioning, it was ascertained that there had been a cessation of the breeding symptoms about the end of November. The most striking result of the examination, however, to one in possession of the previous history of the case, was, of course, the fact that the uterus was not enlarged to a degree commensurate with a natural six and a half months' pregnancy. The probability of the retention of a dead ovum then suggested itself; and it may be noted here that "the feeling of coldness and weight in the region of the pubes," which is regarded by some authors as of importance in indicating this condition, was never at any time present. As there were no urgent symptoms, it was resolved to wait a day or two before any means were adopted to empty the uterus. This delay was interrupted, however, in the afternoon of the same date by the appearance, for the first time, of regular uterine pains. These continued slightly all night; became severe at 6 A.M. next morning (17th February); and in half an hour afterwards the ovum was discharged entire, effective dilatation of the os and expulsion of the ovum having occurred within the last half-hour. The expulsion was accompanied and followed by the usual fresh hæmorrhagic discharge in moderate amount. The patient made an excellent recovery without the least elevation of temperature or other untoward symptom.

Turning now to the examination of the discharged ovum,

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that was of somewhat oval shape, but larger at one end than at the other. Its vertical measurement was 3½ inches, its transverse 2 inches. The placenta occupied for the most part the larger end of the oval. Its uterine surface was covered with fresh adherent blood-clot; but, when this was removed, was seen to be of pale colour, and felt very dense to the touch. When the membranes were cut open, about half an ounce of turbid amniotic fluid escaped, which, like the membranes and the fœtus itself, was of a light brown colour and free from putrefactive odour. The fœtal surface of the placenta had a greenish hue, due to the presence of two apoplectic effusions between the chorion and the decidua. These clots were of a dark purple colour, and had undergone no secondary change. The whole envelope weighed 515 grains. The fœtus itself was mummified. As it lay *in situ* when the membranes were cut open, the head occupied the smaller or lower end of the oval. It measured 4 inches when the lower limbs were extended, and weighed 216 grains. The cord was of variable thickness, but always reduced to less than one line. In development, briefly, the fœtus had attained the age of 4 months. Sections of the placenta, under the microscope, showed that its proper structure had, to a very great extent, been replaced by dense fibrous tissue, with a few fatty elements superadded, so that the death of the fœtus may be ascribed with great probability to a chronic placentitis of obscure origin.

Finally, it remains to indicate the two chief points which a review of this case furnishes—first, the date of the death of the fœtus; and secondly, the period during which the ovum was retained *in utero* after the death of the fœtus. With regard to the former, the fœtus may be inferred to have died about 23rd November, or when pregnancy had advanced to the end of four months—(1) because of the constitutional disturbance and the hæmorrhagic discharge from the vagina occurring at this date; (2) because of the cessation of the breeding symptoms at the same date; and (3) because the actual development of the fœtus, as disclosed by an examination of it after its discharge, corresponded to and was arrested at the age of four months; and, with regard to the latter point, the discharge of the ovum having occurred on the 17th February, it follows that the fœtus was retained *in utero* for a period of eighty-six days after its death, and that without causing any annoyance or detriment to the general health.

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CASE OF MARKED MUSCULAR ATROPHY OF HANDS AND FORE-ARMS — PROGRESSIVE MUSCULAR ATROPHY (?)[1]

BY R. BARCLAY NESS, M.A., M.B.,
Dispensary Physician, Glasgow Western Infirmary, &c.

THE patient, I. T., aged 24 years, was admitted about a month ago into the Royal Infirmary under the care of Dr. Middleton, through whose kindness I am enabled to show the case to-night.

She is affected with marked muscular wasting of both hands, and, to a less extent, of the fore-arms, while she complains of a corresponding loss of power, affecting, however, chiefly the fingers.

Though somewhat improved by the electrical and massage treatment which she has received during the last month, she still exhibits the main features of the condition as they existed at the time of her admission into the Infirmary.

While at a glance it may be seen that the hands are the parts which have suffered most, yet the wasting is also very apparent in the fore-arms. It is evident, too, that the left limb is more atrophied than the right. This is explained to some extent by the fact that the left hand was the part first affected.

It was not, however, the wasting that first attracted her attention, but the gradual loss of power in the little finger. This she experienced first about four years ago. Previous to this she "practised" a good deal on the pianoforte, often spending the greater part of the day in this way preparing for examination. For some months, however, immediately preceding the onset of her trouble she had given up occupying so much of her time in this manner, and even when she played most she never considered it a heavy task, as it was an accomplishment in which she took considerable pleasure.

What first attracted her attention was her inability, when playing, to make use of the little finger of the left hand as freely and accurately as formerly. This gradual loss of power became more and more marked, and then the other fingers became similarly affected—first the fourth, then the third and second, and finally the thumb. At this time she experienced

[1] Read at a meeting of the Glasgow Pathological and Clinical Society, 11th March, 1895.

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no pain, but frequently the affected fingers became to a slight extent numb and cold.

With regard to the wasting, it was only after the lapse of a year that any was detected. The first part she noticed becoming thin was the part on the dorsal aspect of the left hand lying between the first and second metacarpal bones. About the same time the thenar and hypothenar eminences became atrophied. Subsequently the whole hand became affected, and the loss of power in the fingers became more marked.

Two years later the right hand became affected somewhat after the same fashion, the wasting being, however, at first more rapid and more general, though at the present time it is not so advanced in this hand as it is in the left. Subsequently the fore-arms became affected.

On *detailed examination of the left hand*, the skin of which is smooth and more pliable than that of the right, it will be seen that there is marked wasting of the interossei muscles. This is indicated on the dorsum of the hand by the depressions which exist between the metacarpal bones. On the palmar aspect the wasting is also extreme; the thenar and hypothenar eminences have almost disappeared, while the tendons of the long flexors, on account of the atrophy of the palmar fascia and lumbricales muscles, can be easily felt through the skin, especially when the hand is a little extended.

On account of the wasting of the various sets of muscles, the movements of the fingers are greatly interfered with. The hand at rest lies in a position with the joints semiflexed. When extension, however, is attempted, an approach to the "claw-like form of hand" (*main en griffe*) is produced, due to the common extensor and long flexors of the fingers being unopposed in their action by the affected interossei and lumbricales muscles. In the position referred to there is over-extension of the metacarpo-phalangeal joints, while the other joints of the fingers are semiflexed.

Again, the lateral movements (abduction and adduction) of the fingers are interfered with, and this again is due to the loss of power in the interossei muscles.

With regard to the thumb, though flexion of the metacarpo-phalangeal and the phalangeal joints is possible from the action of the long flexor, the power of abduction, and the power of opposing the thumb to the other fingers are almost entirely gone, on account of the loss of power in the muscles of the thenar eminence. Through the fingers being thus

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affected, the patient experiences great difficulty in attempting to button her clothes. If she succeeds, it is by making use of her two thumbs alone. She cannot accomplish it with one hand, nor can she pick up small articles like pins, though she can balance a spoon or fork between her fingers and thumb. She can write well by fixing the pen between the third and second fingers.

In the fore-arm, though the muscles are considerably atrophied, the flexors being more so than the extensors, the loss of power is not sufficient to interfere with pronation or supination, nor with the flexion or extension of the wrist.

The muscles of the upper arm seem normal, with the exception of the triceps, which is slightly wasted, and somewhat weak. The deltoid seems a little flatter than that on the right side, but its action seems perfectly normal.

Taking into account the difference between the deltoids, the condition of the *right arm* is practically the same as that of the left, with the exception that the wasting and loss of power are not so marked.

The muscles in the rest of the body seem unaffected. In none of the affected muscles have fibrillary movements been detected, and in none is there any abnormal irritability to mechanical stimulation. To both the faradic and galvanic currents the affected muscles respond, but less so than the unaffected muscles. The more wasted the muscles the stronger is the current required to produce a contraction. With the galvanic current the same strength is required to produce the kathodic closing contraction (KCC) as is required to produce the anodal closing contraction (ACC).

Common sensation, and the sensation of heat and cold in the limbs are normal.

There is an important point not yet mentioned, that is, that though the *legs* are unaffected, the patient being able to walk and go up and down stairs as well as ever she did, there is undoubtedly considerable increase in the patellar tendon reflex on both sides, though no ankle clonus is present. This point will be found important when we come to consider the question of diagnosis.

With regard to the *general condition* of the patient, she is somewhat anæmic, but otherwise, apart from the condition above described, enjoys good health.

When very young, however, she suffered from suppuration, probably tubercular, of the cervical glands. The old cicatrices

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are at present well marked in the neck. Associated with these are some cicatrices over the upper part of sternum. She had scarlet fever when an infant, erysipelas when 6, and diphtheria when 8 years old. The mother died when the the patient was 3 months old; the cause of death is unknown. The father died at the age of 57 of "heart disease." One brother and one sister, aged respectively 30 and 28 years of age, are alive and well. A brother and a sister died in infancy.

With regard to the *diagnosis*, I believe this is a case of "progressive muscular atrophy." The only other condition which it might possibly be is, perhaps, "simple idiopathic muscular atrophy," and in favour of that diagnosis is the early age at which the disease set in; but progressive muscular atrophy of spinal origin has been known to begin as early as 14 years of age.

The following facts support the theory that the case is one of "progressive muscular atrophy," and not "simple idiopathic muscular atrophy":—

1. No similar condition has been known to exist in other members of the family.

2. The fact of the atrophy and loss of power beginning in the hands.

3. The presence of increased knee-jerk. This is a very important point, because in "progressive muscular atrophy" the lateral pyramidal tracts are extremely liable to become affected along with the grey matter in the anterior cornua, in which case there develop signs of lateral sclerosis. In this patient we have only the increased knee-jerk, but its presence is sufficient to point to a spinal lesion.

The *treatment* has been confined principally to massage and electricity, and under this treatment the condition of the hands has undoubtedly improved, but not to such an extent as to raise the hope of producing any permanent benefit.

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MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING IX.—22ND MARCH, 1895.

The President, DR. HECTOR C. CAMERON, *in the Chair.*

DISCUSSION ON DIPHTHERIA.

(*Continued from* p. 62.)

DR. GLAISTER.

THE discussion was resumed by Dr. Glaister, who said that, after the previous very exhaustive consideration of the subject from a bacteriological standpoint, he proposed to limit his remarks to three points—viz., the statistical, the preventive, and the narration of cases.

STATISTICS.

The earliest published cases of diphtheria treated by serum are quoted from the *Deutsche Medicinische Wochenschrift*, 27th April, 1893,[1] and were a series of 30, by Behring and Kossel; of these, 24, or 80 per cent, recovered.

On 19th April, 1894, Ehrlich, Kossel, and Wassermann, in the same journal, published the results of 220 unselected cases of diphtheria treated by serum of goats rendered immune by giving them increasing doses of dead diphtheria cultures.

Among the 153 cases in which tracheotomy was not needed, the mortality was 23·6 per cent.

Then Weibgen-Hahn's clinic in Berlin (same journal, 19th July) reported 65 cases. Certain patients of this number required tracheotomy, and of these 44 per cent recovered. Of the others, 72 per cent recovered. The type of disease was, however, benign.

French Statistics.[2]—Before using serum the mortality from diphtheria in Parisian hospitals, according to Roux, had scarcely

[1] *British Medical Journal*, 8th September, 1894, p. 545.

[2] *Cf. British Medical Journal*, 27th October, 1894, p. 931.

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ever been below 50 per cent; since its use, the mortality has fallen to less than 24 per cent, all of the cases being diagnosed bacteriologically. In the diphtheria wards of the Trousseau Hospital, for the four years before the serum treatment, the mortality was 51·71 per cent of the total cases. From 1st February to 24th July, 1894, the serum treatment was applied on 448 children, of whom 109 died, equal to 24·5 per cent mortality. During the same time, at the Trousseau Hospital, when the serum treatment was not used, there were 520 cases, of which 316 died, equal to 60 per cent mortality.

To show that in the period of time chosen the results were not attributable to the presence of a *benign* type of the disease, in the cases treated by serum at the Hospital for Children the mortality fell to 12 per cent; while during the same time, at the Trousseau Hospital, without serum, the mortality was 32 per cent, while over Paris, during the previous four years, of deaths where tracheotomy was not required, the mortality was 33·94 per cent.

A committee of the Paris Academy of Medicine, appointed to consider the value of the "serum" treatment of diphtheria, reported that, after observation, "We are now in possession of a specific treatment of diphtheria as powerful as it is harmless."

"*The Brute Force of Figures.*"—In the early part of December last year, the Medical Society of Berlin had under discussion this new diphtheria treatment. Dr. Hansemann opened by a strong indictment against the treatment, especially against the theories upon which it was based. He did not believe that the Lœffler bacillus was the cause of all cases of diphtheria; and while he admitted the cures obtained, he asserted that the cures were not from diphtheria, but only from "diseases caused by Lœffler's bacillus." He further complained that urticaria, purpura, fever, cardiac weakness, rheumatic pains, coma, violent perspirations, albuminuria, were apt to immediately follow the treatment, although he acknowledged not a single patient had died from any of them.

The veteran pathologist, Professor Virchow, took part in the debate later on; and, as one previous speaker mentioned in the course of his remarks, "A burnt child shuns the fire, and from tuberculin I had carried away bad burns," it was to be expected that Virchow's views would be worth listening to, and also great deference paid to them. Virchow told his audience that this new treatment was begun, in March of last year, in one of the Berlin hospitals, and that by June and

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July all the diphtheria cases admitted were treated with this serum. The results were:—

	Children.			Children.	
	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	13	1	5th week,	6	2
2nd ,,	9	1	6th ,,	1	1
3rd ,,	6	2	7th ,,	3	0
4th ,,	12	1	8th ,,	5	0

The supply of serum suddenly ceased, because the horses which supplied the serum died. The hospital authorities were compelled to fall back upon the usual ordinary lines of treatment, with the following results:—

	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	5	7	5th week,	8	5
2nd ,,	6	8	6th ,,	8	12
3rd ,,	6	6	7th ,,	13	6
4th ,,	8	11			

The hospital authorities, alarmed at the increased mortality, obtained a new supply of serum; immediately a beneficial change took place in the mortality rate:—

	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	3	2	4th week,	14	2
2nd ,,	4	1	5th ,,	17	1
3rd ,,	14	1	6th ,,	17	5

—the total figures being 533 cases, of which 303, treated with serum, had a percentage death-rate of 13·2; while 230, treated without serum, had a percentage death-rate of 47·8. After the narration of these facts and figures, Virchow added: "All theoretical considerations must give way to the brute force of these figures." He held it to be the duty of every physician to use the remedy in every case of diphtheria, although he himself could not explain the action of the serum.

In the course of the same debate, Professor Baginsky,[1] of the Kaiser and Kaiserin Friedrich Hospital, upheld the treatment. He stated that, during the year 1894, he had 533 cases of diphtheria. Of *these*, 303 had been treated with serum, with 40 deaths, equal to 13·2 per cent mortality; and 230 had not been treated with serum, with 110 deaths, equal to 47·82 per cent mortality. "No previous remedy," said he, "had done for diphtheria what the serum had done."

[1] *British Medical Journal*, 22nd December, 1894, p. 1458.

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Vienna Discussion (Royal Medical Society).—Dr. Unterholzner gave figures of treatment in Leopoldstadt Children's Hospital, Vienna, as follows:—

Treated with Serum.			Treated without Serum.		
Age.	Treated.	Died.	Age.	Treated.	Died.
Under 1 year,	2	1	Under 1 year,	2	1
1 to 2 years,	9	5	1 to 2 years,	6	6
2 to 3 „	7	2	2 to 3 „	7	6
3 to 4 „	3	0	3 to 4 „	5	4
4 to 5 „	2	0	4 to 5 „	2	2
5 to 6 „	1	0	5 to 6 „	2	1
6 to 7 „	2	0	6 to 7 „	2	2
7 to 8 „	2	0	7 to 8 „	6	1
8 to 13 „	3	0	8 to 13 „	4	1
	31	8		36	24

Further Statistics from Austria.—Dr. Germonig,[1] to the Medical Society of Trieste, gave the results of the treatment of 224 cases of diphtheria by Behring's serum, the mortality being 20·3 per cent. The mortality (usual) from this disease in the civic hospital in the years from 1886 to 1894 was 60 per cent of all cases admitted. To show the type of disease from which the above 224 suffered, he pointed out that of 65 cases treated without serum, 33—*i.e.*, 50·7 per cent—died.

British Statistics.—Paper read before the Clinical Society of London by Drs. Washbourn and Goodall and Mr. Card jointly[2]:—

CASE MORTALITY OF DIPHTHERIA IN CHILDREN UNDER 15 AT THE EASTERN HOSPITAL, LONDON.

	Cases.	Deaths.	Mortality Per Cent.
1893,	397	166	41·8
1st January, 1894, to 22nd October, 1894,	400	144	36·0
„ 1893, to „ 1894,	797	310	38·8
14th September, 1894, to 22nd October, 1894 (39 days, not treated with serum),	72	28	38·8
23rd October, 1894, to 27th November, 1894 (36 days, cases treated with serum),	72	14	19·4

Mortality reduced 50 per cent.

[1] *British Medical Journal*, 2nd February, 1895, p. 262.
[2] *British Medical Journal*, 22nd December, 1894, p. 1418.

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FIGURES ILLUSTRATIVE OF TREATMENT OF DIPHTHERIA AT THE WESTERN FEVER HOSPITAL, LONDON, WITH AND WITHOUT ANTITOXIN.

1. *Without Antitoxin.*

CASES ADMITTED FROM 26TH NOVEMBER, 1893, TO 25TH JANUARY, 1894.

AGE PERIODS.	Admissions.	Deaths.	Percentages.
0 to 5 years, ...	20	12	60
5 to 10 ,, ...	21	6	28·57
10 to 15 ,, ...	7	...	...
15 and upwards, ...	10	1	10
Totals, ...	58	19	32·85

2. *With Antitoxin.*

CASES ADMITTED FROM 26TH NOVEMBER, 1894, TO 26TH JANUARY, 1895.

AGE PERIODS.	Admissions.	Deaths.	Type of Disease.			Complications.		Death-rate.
			Severe.	Moderate.	Mild.	Rashes.	Arthritis.	
0 to 5 years, .	40	5	15	18	7	10	1	14·7 per cent.
5 to 10 ,, .	22	5	13	7	2	6	1	
10 to 15 ,, .	4	...	2	2	...	3	2	
15 and upwards,	2	...	2	...	...	1	...	
Totals, . .	68	10	32	27	9	20	4	

All the above cases were verified as being diphtheria by bacteriological diagnosis.

In the North-Western Fever Hospital, of 43 cases, diagnosed bacteriologically and treated with serum, only 2 died, giving a death-rate equal to 4·6 per cent. Of the 43 cases, only 7, however, were deemed severe.

ANTITOXIN TREATMENT OF DIPHTHERIA—TABLE OF CASES COLLECTED DURING PREVIOUS THREE MONTHS[1] BY COMMUNICATIONS FROM VARIOUS MEDICAL MEN.

Total Number of Cases.	Deaths.	Percentage of Deaths.
95	22	23·1

[1] *Cf. British Medical Journal*, 2nd February, 1895, p. 259.

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Prevention.

So far back as 1887 the Port Health Authorities of New York adopted bacteriological examinations for the diagnosis of epidemic cholera, which were found of "incalculable" service. In 1892 the City Sanitary Authorities followed suit, establishing a bacteriological laboratory for this purpose.

Arising out of this, the investigation of doubtful cases of diphtheria followed as a matter of expectation, and examinations were made, in 1892, of about 400 cases of diphtheria which were under treatment in the health hospitals. Dr. Biggs reported that the value of such work was priceless, and that every opportunity should be afforded the profession of New York in having preliminary bacteriological examinations made of all doubtful cases of this disease. This report was adopted, and the scheme was put into operation in May of 1893. That it was recognised as a great boon by the medical profession is evidenced by the fact that, in the first year thereafter, 5,611 cases had been examined by bacteriological tests. About two-thirds of the total number were proved to be *bonâ-fide* diphtheria, although the physical signs were doubtful.

New York was, therefore, the first Sanitary Board in the world to take this step. This example has been since followed by other large cities of the United States, by the U.S. Marine Hospital Service, and by the medical corps of the U.S. army.

Of the advisability and great usefulness of such a laboratory not a single word requires to be said. It is unfortunately too true that there are always doubtful cases, the diagnosis of which can only be accurately made, and conclusively fixed, by bacteriological examination. From this much undoubted harm arises, not only in private life, but also in public epidemic hospitals. A doubtful diagnosis may give rise to needless alarm in a family circle, or that circle may be lulled into a false repose; a scarlatinal sore throat may be diagnosed as diphtheria, and the patient put into a ward for the treatment of diphtheria cases, with grave risk alike to the new-comer and to the occupants. All this is prevented when facilities are given for bacteriological examination. In order that such a scheme may be carried out satisfactorily, certain details require consideration, but they can be overcome successfully.

Systematic bacteriological examination has also the great advantage that it enables the physician to say, in a way he cannot otherwise certainly do, that the patient who has been suffering, is or is not, after a lapse of time, free from the

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disease. For it has been clearly shown that, occasionally, some time after the physical signs have disappeared, bacilli are found remaining in the air-passages. While, in the large bulk of cases, it may be said that patients who have survived are free from infection by the end of twenty-one days, examination by bacteriological tests has demonstrated the bacilli in the air-passages—in some cases at the end of *four*, and also at the end of *five weeks*, showing that, during this increased period, the patients are still infectious.

When a case of diphtheria attacks one child in a family of children, usually the attacked child is isolated, while the others are sent from the house, to perhaps turn ill later on. They are supposed to be free of the disease because they show no signs of illness; but it has frequently been demonstrated that, although showing no signs of illness, these children have the characteristic bacillus of the disease in their air-passages. Under such circumstances the early forewarning would enable measures to be more quickly taken.

Treatment, with Narration of Cases.

In Great Britain, Dr. Armand Ruffer was the first to treat the horse by Roux's method, and the first to prepare the first antitoxin made in this country. In the month of October of last year, Dr. Russell, the senior Medical Officer of Health of this city, and myself required to be in London on matters which embraced an inquiry into this department, and one of the places we visited was the British Institute of Preventive Medicine. Dr. M'Fadyen, the distinguished collaborateur of Dr. Ruffer, was good enough to give us elaborate details on this subject, and he informed us that the first serum of the first horse treated in Great Britain was to be drawn from the animal that morning. We were in the laboratory when the beakers containing the blood—consisting of a well-defined clot and separated serum—arrived from the stable; and we thus, in an indirect way, assisted at the first step in the antitoxin manufacture in this country.

To add to our many other obligations, Drs. Ruffer and M'Fadyen were good enough to forward to each of us a satisfactory quantity of this same serum after it had been standardised. What the fate of this was, in my own case, will fall to be now related.

Since I received my first supply of serum from Dr. Ruffer, on the 10th of last November, I have only seen two cases of diphtheria, and neither of these was under my own care;

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therefore, what is to be said of them has the additional value that each case has the testimony of two observers.

CASE I.—The first case was one in Kincardine-on-Forth, and the patient was injected by me on the 13th of November. The patient was about 9 years of age, and his uvula, fauces, and post-pharyngeal wall were found covered with exudation. The quantity of serum injected was 15 c.c., by means of a Koch syringe. Dr. Reddie, under whose care the patient was, wrote me, the day following, that after the injection the patient slept most of the day, the temperature was normal, and pulse 84 at night. Next day, the 14th, the membrane appeared less extensive; seemed shrunken and looser; other symptoms favourable. On the morning of the 15th, Dr. Reddie reported that there was not a trace of membrane to be seen, but the parts appeared reddened from which the membrane had separated. The boy made an uninterrupted recovery. Dr. Reddie remarks in his last letter that "although, at the time you saw him, his temperature was normal and everything looking favourable, still I do not think the membrane would have disappeared so quickly without antitoxin, even under the best results of the old treatment."

CASE II.—The second case was under the care of Dr. Pride, of Neilston. The patient was the third person attacked in the house, the two previous having died. I used the serum on the 1st December. After the injection, the boy, writes Dr. Pride, "slept for an hour, awaking in a profuse perspiration, but with no rigor or tendency to it. The pulse and temperature, before the use of the serum, were each 100. When I called at 4 P.M. the pulse was 84; temperature, 100°. At 11·40 P.M. I found pulse 84; temperature, 99·4°; and the patches now looked whiter and thinner.

"Next day, the 2nd (morning), pulse, 84; temperature, 101°. Patient has coughed up blood-stained mucus, and has bled from nostrils a little. Membrane on left tonsil shreddy looking; that on right thinner and smaller, but not loosening at edges. At night visit the pulse was 76; the temperature 99·3°. Next day, the 3rd (morning visit), the patient has perspired copiously in early part of night, and afterwards slept calmly; pulse, 72; temperature, 99°. On looking into the throat, I find membrane quite gone, having been coughed up in early morning, and an excavated ulcer occupies site of membrane on right tonsil, where separation first appeared. I need scarcely say the result is most satisfactory.

"Since writing the above, I find this morning a greyish patch of membrane has reappeared at front edge of the ulcer spoken

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of as on right tonsil. Otherwise the lad is doing well, though pulse is 86, and temperature 100·3°—a rise in both. I hope these portend no new distubance."

Again, on the 6th, Dr. Pride wrote me to say that "the membrane has all disappeared from the boy's throat," and that "he is now doing very well indeed." The boy made a rapid and excellent convalescence.

In addition to these three cases in this house, two having died, the third being the subject of the foregoing clinical remarks, two other children, who were removed to Glasgow on the outbreak of the attack, were also seized with the disease, and were treated in Belvidere Hospital. They also recovered after a prolonged illness.

I can form no conclusion of the general value of the serum treatment from these two cases, but I agree with both of my medical friends that ordinary remedies would not have produced such a rapid disappearance of the membrane, and such a summary conclusion of the disease. I will feel it hereafter to be my duty, as soon as I diagnose this disease, to at once apply this remedy, for I believe that it is a very valuable antidote to the disease, based, as it is, on right lines.

Dr. JOSEPH COATS.

Dr. Joseph Coats spoke of the subject of immunity to diphtheria as one which had interested him as a pathologist. To him, as to most of those who had read of them, some of the various developments had come as matters of surprise as well as of interest. One was prepared for some of the discoveries which had been made in regard to the artificial induction of immunity. It was not surprising, for example, that, after the introduction of cultures, supposing the animal to survive, it acquired an immunity from the disease. It was, however, matter of surprise that it was not necessary to introduce the microbes; that the introduction of the toxin was sufficient to produce immunity. Still less was one prepared for the fact that the serum of the immunised animal can, if introduced into another animal, render it also immune.

As a pathologist, Dr. Coats naturally looked about for the explanation of such facts. Dr. Ruffer had made some references to pathology, and, while much charmed with the lucid account given of his methods of working, Dr. Coats could not agree with some of his pathological observations. He (Dr. Ruffer)

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objected to this term "antitoxin," and on grounds which would be sufficient if they applied to the case in point, but Dr. Coats thought that they did not apply. The objection was that the so-called "antitoxin" did not act directly, as a chemical antagonist would. But the question was not one of simple chemistry, but of vital action and vital chemistry. When one spoke of a *toxin* one did not think of a simple chemical action. The toxin was a poison, and, in speaking of a poison, he thought of intimate vital processes—chemical, no doubt, but belonging to vital chemistry. Poisons had to do with vital chemistry, not simply with ordinary chemistry, and antitoxins might be presumed to act in the same way, but in the opposite direction. So the argument against that term did not hold good; though in a bottle, out of the body, the toxin and antitoxin did not act as ordinary chemical antagonists, that was no reason why the antitoxin should not act as an antagonist in the body of an animal, and so warrant its name. While a toxin had a very strong action on the living cells, even in very small doses, as was illustrated in the case of tetanus, an antitoxin in small quantity might be supposed to have an action on living cells, and Dr. Coats thought that it was as much an "antitoxin" when it acted in the body (though not in a bottle) as if it acted outside the body.

Again, Dr. Ruffer, in speaking of phagocytes, had gone beyond what Dr. Coats could admit. In the case of natural immunity he thought that phagocytosis probably played a great part, but it was stretching the word too far to make it include antitoxic action. When they thought of what probably happened in a diphtheria case, the matter might be made clearer. In a diphtheria case the microbe was active in the false membrane—*i. e.*, in the dead matter outside the living body, but it did not penetrate into the living tissues. The microbes evolved their specific poison or toxin, which had its local effect on the tissues, producing an intense inflammation, and had also a more general effect on the body as a whole by being absorbed. If the antitoxin were introduced, the living tissues were put into a position to protect themselves against the toxin. The results of this were seen both locally and generally. Locally, the exudation and the symptoms of inflammation disappeared. The general symptoms also improved, and, unless too much poison had already been introduced, the patient probably recovered.

Turning to the bacilli themselves, which are primary agents in the whole process, it is a peculiar and unlooked for result of observation that they do not seem, in their mere growth

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and multiplication, to be much affected by the antitoxin. It appears that the bacilli are capable of being cultivated in the blood-serum of an immunised animal, or, in other words, in presence of the antitoxin. In the actual case of diphtheria, also, they continue to grow in the exudation after the administration of the antitoxin. The effect of the antitoxin, however, is to diminish or stop the exudation, and also to promote its elimination by absorption or discharge. In this process, no doubt phagocytes play an important part. It is to be remembered that phagocytes act, not only on bacilli, but also on any material which they are capable of taking up and digesting. The removal of the exudation doubtless diminishes the pabulum for the bacilli, but they may survive in the natural secretions of the part, and have been found in the throat, even in a virulent form, weeks, or even months, after the attack.

All this seemed to prove that the action of the antitoxin was one of antagonism, not to the growth of the bacilli, but to the action of the toxin; and that this action of the antitoxin was not exercised through phagocytosis, but consisted in the opposition of one agent, having intimate relations to the animal cells, to another agent which had similar relations.

The prolongation of the growth in the throat of the virulent cultures explained the mysterious spread of diphtheria, which was sometimes put down to defective drainage and to sewer gas.

DR. A. K. CHALMERS.

Dr. Chalmers remarked that it had been alleged that diphtheria was becoming increasingly prevalent of late years, and he should ask them to consider whether any evidence of this was forthcoming.

It had also been alleged, by way of explaining this increased prevalence, that school attendance must be held responsible, because the increase took place subsequent to the passing of the Education Act.

It was necessary, first of all, to enquire whether any increase had taken place, and he thought he should be able to show that it was chiefly from English statistics that the impression arose.

He would ask their attention shortly to a chart which illustrated the movements of the death-rate from the disease in Scotland, and in Glasgow over several years, but as the experience of Scotland seemed to differ widely from that of England in recent years, he might first bring under their

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notice some figures regarding the prevalence of the disease south of the Border. He found, for instance, that in the year 1881 the death-rate from diphtheria alone for all England was 12 per 100,000 of the population living; in the year 1889 it was 18; and in the year 1893 it was 31. Some error, of course, lay in the comparison of single years, but the mean death-rate of the ten years, 1883-92, was 17 per 100,000 for all England, so that, as compared with this period, the increased incidence in 1893 was very striking.

In the twenty-eight large towns of England the death-rate in 1881 was 14 per 100,000, and in 1889 it was 26. For the decennium, 1871-80, in London the death-rate was 12 per 100,000; and for 1881-90 it was 26 per 100,000; while, of the individual years, 1881 had a death-rate of 17; 1889 a death-rate of 39; and 1893 a death-rate of 75 per 100,000. From these figures it was manifest, therefore, that there had been an increased prevalence of the disease in England, especially in the large towns.

But if they turned their attention to a chart which he had had constructed, and which showed the movement in the yearly death-rates from diphtheria in Scotland since civil registration began in 1855, they found that between 1865 and 1890 the movement, although fluctuating, was, on the whole, downward. For the decennium, 1861-70, the deaths in Scotland from diphtheria alone were at the rate of 29 per 100,000; in 1871-80, they numbered 27; and in 1881-90, 21. As contrasted with this, the curve of the death-rate from diphtheria in Glasgow during those years showed a slightly upward tendency; the mean death-rate for the successive decennia, 1861-70, 1871-80, and 1881-90 being 25, 27·1, and 27·9 respectively per 100,000. The chart also contained a curve showing the death-rates from croup alone. These croup deaths were becoming progressively fewer, and if a comparison was made of the curve constructed on the combined death-rates from croup and diphtheria, and on that for diphtheria alone for Glasgow, as was done in a smaller chart which he showed, it would be seen that, while the mass of deaths from croup and diphtheria tended to shrink, that of diphtheria alone became proportionately increased. The impression, indeed, created by this contrast was that, while the death-rate from diphtheria in Glasgow was numerically increased, this increase was rather due to a transference of deaths from one group to the other. Shortly, it meant that deaths formerly attributed to croup were now attributed to diphtheria.

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Summarising what had been stated, there was evidence that, until recent years, there had been a greater prevalence of diphtheria in Scotland than in England. Now the position was being reversed, and a wave of diphtheria prevalence, beginning some years ago in the towns of England, had now spread throughout the rural districts. Knowing what we did of the tendency of epidemic disease to assume more or less pandemic activity, it seemed as if one must look forward with some apprehension to a possible increased prevalence of diphtheria in Scotland within the next few years. This was suggested by a wide-spread prevalence of the disease in England which had occurred in the years 1858-59, and was followed by a similar epidemic prevalence in Scotland in 1862-64. It was manifest, however, that since the introduction of compulsory education there had not been any increase of diphtheria in Scotland, so far as could be inferred from the death-rate. But schools might, he believed, become instrumental in the spread of disease, and he had before him one excellent illustration, supplied by the occurrence of about a dozen cases within a short time of each other, in the infant department of a school, where the spread of the disease was arrested coincidently with the interchange of slates among the children being stopped. He had given some attention to this question of school attendance lately, and, in the closing months of last year, had taken 100 cases of diphtheria as they occurred in the city, in the order of their notification, and investigated the surroundings and history of each case. Of these cases, 62 were in attendance at 42 separate schools—one school had 5 cases; another had 3; and no other school had more than 2. These cases covered a period of fully six weeks, and, in all but 8, the element of the school association was absent, so that the conviction forced on him was that, while one could not but recognise that school attendance offered peculiar facilities for spread by contagion, there was no evidence that it was operative in Glasgow beyond what one occasionally found to be the case in connection with the spread of scarlet fever.

The time limit for the speaker having been interposed, Dr. Chalmers was unable to refer, as had been his intention, to the question of drain effluvia; but, later in the evening, he was asked to continue his remarks on this point. He was pleased to hear Professor Coats's emphatic protest against the assumption that diphtheria always, or even frequently, meant bad drainage. This question was of increasing importance, especially, he believed, from its medico-legal bearings. Given

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a house where diphtheria co-existed with ascertained defects in drainage: was it possible to define the relationship in which the illness stood to the imperfect drain? Investigation usually stopped with the discovery of the drainage defect, and it was assumed, without further questioning, that the source of the illness was thereby fully explained. It was, of course, to be remembered that a well made, freely running, and thoroughly ventilated drain was not in the question. What was implied was that the drain was broken or badly constructed, so that the retention of the contents was encouraged either in the drain or about it. Decomposition thereupon resulted, and the gaseous products of putrefaction drew attention to the process. To some extent, therefore, this question of drain effluvia might be regarded in common with that other source of effluvia—viz., the manure heap, which in country districts almost replaced the drain on public regard as a cause of diphtheria. It was not an uncommon thing, for example, to hear of cases of diphtheria attributed to the storing or spreading of manure on fields; and just as where diphtheria and a broken drain co-existed, the question here arose whether the diphtheria was due to the manure. In both, he thought, it must be admitted that the presence of specific contamination was at least possible. If we reviewed what evidence there was of an indubitable connection between gaseous effluvia thus arising and symptoms of disease, there was at once a frank recognition that exposure to drain effluvia and manure effluvia might result in sickness of some form. These symptoms varied much: from the nausea and vomiting which might quite readily follow momentary exposure to any nauseating smell, to a condition of sepsis manifested in sore throat and septicæmia, and which could only result from the action of septic organisms. There was, moreover, the duration of the exposure to be considered; and when this was prolonged, as by residence in a house with defective drainage, the resulting conditions were characterised by blood deterioration, such as anæmia. The phrase "gaseous ptomaines," he understood, had been devised to explain the connection; but apart from any chemical theory to explain it, there was a practical unanimity in believing that chronic ill-health did result from exposure to these drain effluvia, and that, while falling short of direct causation, there was a generally accepted and well-founded belief that the mucous respiratory surfaces have their normal refractoriness to the diphtheria organism inhibited by this exposure.

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He had had his attention directed, some time ago, to an outbreak of diphtheria in a rural district. The cases were chiefly confined to the scholars attending a certain school, and were, indeed, almost restricted to those attending a certain class-room in the school. In this school-room there were both an imperfectly constructed drain and frequent exposure to manure effluvia; but both conditions had continued for years, until a definite introduction of the diphtheria organism took place, in the person of a girl who died of the disease. Here all the children attending the school were equally exposed to the manure effluvia; but the diphtheria and an allied throat affection (for many such did not rise clinically to the description of an attack of diphtheria) attacked only those children who spent some part of the day in the class-room in which the first case occurred. Contrasting the experience in this school with that of one not very far distant from it, but which was of recent construction, and had neither imperfect drainage nor any adjacent manure traffic, there was this striking difference, that while diphtheria had been introduced into this last on two separate occasions, it was not followed either time by a secondary attack. It was difficult, therefore, to escape believing that this difference was due to the drain and manure effluvia breathed by the children attending the school first mentioned. Indeed, it amounted to an object-lesson on the power of personal contact to propagate the disease when the way was first prepared by such influences as were at work in this school.

Regarding the origin of this outbreak, although it was usually easier in the country to find some explanation of the source of infection than in crowded populations, one was here compelled, by exclusion, to fall back on the habits of the child who first suffered from the illness. Manure heaps are an attraction to children in the country. They frequently contain bright and attractive pictures, and pieces of broken crystal, which the children gather and treasure as playthings. The fingers of the children become soiled in the search, and the articles not infrequently find their way to the mouths of the searchers. If one, therefore, could assume that manure heaps, even occasionally, retained the specific poison of diphtheria, there was then established a direct source of infection. Every one attending patients in the poorer districts was familiar with the devices for absorbing expectoration adopted by the poor. A handful of ashes or sawdust, or a folded piece of paper, or a piece of broken earthenware, as often as not formed a receptacle, where, indeed, there was any

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pretence of using one at all. Where a custom of this sort prevailed, the ashes, or sawdust, or disused china would find its way to the ash heap, and from that it finally got to the manure heap. This method of transplanting infection assumed handling of infected material by the children; but it seemed quite logical to assume that the air passing over a manure heap containing ashes or sawdust so impregnated might carry with it the germs of a specific infection to any one passing in the neighbourhood. Indeed, he quite believed that sporadic cases might thus be caused.

With special regard to drain effluvia, it is somewhat more difficult to obtain a precise view of its relationship to the infection of diphtheria. It was quite true that many cases of diphtheria existed in houses where a leaky drain could be ascertained to exist; but one had only to watch a certain number of cases to find that the defective drain, if present at all, was, as often as not, in a neighbour's house. In the inquiry of November and December, which he had previously referred to, it was part of the scheme of investigation to note the condition of the drainage wherever complaint was made. In 46 of these 100 households there was no complaint whatever made by the inmates as to smells existing in connection with the drainage arrangements of any part of the household. In the remaining 54, in all of which complaint of smell was made, 26 were found to have their drains in a tight condition on the application of the smoke test. In the remaining 28 cases defects in the drainage were discovered; but in 21 instances this defect was not in the house of the patient, but in some other house in the same land; while in 7 cases only did defective drainage exist in the same household with the diphtheria. As having some bearing on the question of dampness in the walls or floor of a house, it might be noted that the situation of the house was as follows:—

Fourteen were situated on the ground floor, 30 on the first floor up, 18 on the second up, and 27 on the third floor, the remaining 11 cases being in villas or elsewhere, with the sleeping apartment upstairs.

While the investigation was thus inconclusive both as regards drainage and dampness, one frequently found a tendency in the cases to aggregate themselves, so that association with each other was suggested; and one was left to conjecture, whenever the connection could not definitely be traced, that personal contact of sick with healthy was much more frequently than is recognised the determining cause of an

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attack. Certain conditions would, of course, increase susceptibility; and he thought there was sufficient evidence to prove that both manure and drain effluvia had this power.

DR. WILLIAM WATSON.

Dr. Watson said that it was a recognised thing that diphtheria was much more liable to attack people who had chronically enlarged tonsils. During secondary dentition the gums of children were allowed to get into a very unsatisfactory condition on account of the decaying teeth not being extracted, thus causing the constant presence of suppuration in the mouth. This ultimately led to the enlargement of the tonsils with the attendant evils, not the least amongst these being the increased tendency amongst those so affected to attacks of diphtheria, scarlatina, &c.

So far no one had been able to show what was the true cause of diphtheria. Some had attributed it to bad drainage, but no one had been able to prove this. That it was spread by milk and by direct personal contact, every one agreed, but from the fact that it could not be held in check, like small-pox or typhus fever, it was clear that there was something about its propagation of which we were still ignorant. In a community where either of the above-mentioned diseases prevailed, it was usually an easy matter to trace one case to another, but with diphtheria what seemed a surprising thing was, that it was rare ever to get a history of associated cases unless they were members of one family. Cases were certified in different localities of the town, and often there was clear proof that the sufferers could never have been near each other. Another striking thing was the marked difference in the degree of virulence in the cases admitted to the hospital. In some it was a mere *nomen morbi*, and one could safely infer that, but for association, the diagnosis would be a matter of extreme difficulty. A frequent history was that other members of the family had suffered from sore throat, but that the attack was so slight as not to interfere with their duties. From these facts it would readily be understood that an enormous number of cases of diphtheria, probably more than one half of the total, were not recognised as such; and in this way became the means of continuing the spread of the disease.

It would be impossible to over-estimate the influence schools had in spreading this disease, for at the very time children were most liable to take it they were most exposed to the

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chances of being attacked. Confined, as children were, in warm rooms notoriously difficult to ventilate, and allowed to pass from them at frequent intervals without proper protection from cold, they were very liable to catarrhal affections of the respiratory tract. This fact, combined with the prevalence of enlarged tonsils and post-nasal adenoids in children, showed what a well-prepared soil there was for the growth of the diphtheria bacillus. Under such conditions the spread of diphtheria could be most fully studied. From what has been already said about mild cases continuing to go about, their presence in a school would give rise to most deplorable results, and, unless such cases were dealt with, it would be impossible to hold diphtheria under control, as typhus fever, small-pox, or even cholera is held. There ought to be medical officers appointed, either by the Local Authority or by School Boards, to examine all children attending school at frequent intervals. Slight cases of this disease, and also unnoticed cases of scarlet fever, measles, chicken-pox, &c., would, in this way, be discovered. It was a well-known fact that, at the commencement of all epidemics, the cases were, as a rule, mild, and apt to be overlooked, but when searched for and discovered at this early stage, much sickness and life might be saved.

All the throat and nose affections could thus be pointed out, and a chance given of having these defects rectified before they had stamped their evil effects on the children for the rest of their lives.

It was to bacteriology that we looked for much help in diagnosing many doubtful cases, but often this aid was not at hand. Again, the bacteriological results were not always accurate, as there was still something about the life history of the diphtheria bacillus that we did not understand. In several cases that had been under his observation, and where there was intimate association between the cases, in some the true Lœffler bacillus was found; while in others nothing but streptococci were detected. Even cultures from the membranes gave the same results, and these were in cases where the clinical appearances seemed identical. Hence, he inferred that there were intermediate stages in the development of the bacillus, and that we were not sufficiently well acquainted with its different forms to place absolute reliance on bacteriological results. This being the case, we should not lose sight of the clinical appearances which were at present too apt to be overlooked. The position was this:—The presence of the diphtheria bacillus would confirm a diagnosis previously made, in all probability, from the clinical features; but it might

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be absent from a case which was directly associated with cases where it was present, and which had all the clinical appearances of diphtheria.

The affections of the throat most likely to be mistaken for diphtheria were scarlatinal, post-scarlatinal, septic, syphilitic, and catarrhal, including those resulting from measles, typhus, and enteric fever. Of these, the greatest difficulty arose with the catarrhal conditions, and this probably from the fact that we never get faucial diphtheria without a certain degree of tonsillitis. The diphtheria bacillus chose for its seat of growth lymphoid tissue. At first its action was confined to this tissue, and if the fauces was the part first affected, the consequence was that the first pathological change was in the tonsil. There was a distinctly limited area of congestion, the whole appearance being that of an inoculated sore. In tonsillitis, on the other hand, there was no such limit to the congestion. There was a catarrhal state of all the buccal mucous membrane, and an increase in the amount of its secretion. This, from the free surfaces, was either swallowed or expectorated; but it was imprisoned in the deep invaginations over the tonsil, and caused great distension. The action of the diphtheria bacillus also caused a catarrh of the mucous membrane: there were the same, though not so intense, redness and swelling, the increased amount of the secretion, and the distension of the crypts with their yellow points of escaping secretion—in other words, a tonsillitis. Of course, if, in addition to the above appearances, membrane were present, then the diagnosis would be easily made; but membrane often quickly forms and quickly separates, and while present at one examination, it might be absent at the next. We have, then, to fall back on the localisation of the irritation, which is chiefly confined to the tonsil. If it passed beyond, it would spread by continuity of tissue, and always have distinct lines of demarcation, its chief course being along the edge of the soft palate to the uvula.

There was usually less difficulty in distinguishing between a scarlatinal and a diphtheritic throat, as the presence of a rash rendered the diagnosis in most cases easy. But there were cases where the rash was so ephemeral that it was not observed, and doubt might arise before the rash appeared. An important guide was the fact that vomiting at the commencement of diphtheria was not a common thing, whereas it was rarely absent in scarlet fever. The tongue in the early stages of scarlatina was thickly coated, and as the

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disease advanced it began to clean from before backwards, leaving the characteristic "strawberry" appearance. In diphtheria the tongue might be quite clean, and rarely presented the dirty, furred appearance of a "scarlet" tongue. An acute tonsillitis was present in scarlet fever, and no part of the throat structures escaped congestion. The great help, however, was the appearance of the typical punctate rash on the palate. This came early and stayed late, and the covering of the palate being epiblastic structure, the same appearance was presented there as was seen on the skin.

In the fourth week, or perhaps later, of scarlet fever, ulcerative changes might begin on the throat. These might appear as small holes in the hard or soft palate, and might, with clean-cut edges, perforate the soft structures there. This destruction might go on until all the soft tissues of the throat, nose, and ear were destroyed, and the bones became exposed. In one case which he had seen, so extensive was the ulceration that the contents of the stomach were vomited through the ears as well as through the mouth and nose. But a milder form of this condition was very apt to be mistaken for diphtheria. There was destruction of the mucous membrane, with the exudation of lymph on the floor of the ulcer formed. This had quite a different appearance in life from what was observed after the parts had been removed *post-mortem*. This was, no doubt, due to the confusion arising from the reflection of the light from the concave walls of the buccal cavity. On trying to remove the supposed membrane, difficulty was encountered, and bleeding followed, just as was the case in diphtheria. This condition might be mistaken for post-scarlatinal diphtheria, which was supposed to be so common.

In septic and syphilitic conditions of the throat there was always necrosis, whereas in diphtheria this was an extremely rare thing, unless, in the endeavour to destroy the organisms, the living tissue cells also had been destroyed.

The catarrhal condition of the throat in measles was not infrequently mistaken for diphtheria, particularly where laryngitis was also present. The presence of the rash on the palate was of great service in such cases also, particularly as it appeared in most cases before the rash on the skin. Tonsillitis did sometimes occur in measles, but was not common, and such a condition was rare in typhus and enteric fever. In the two latter the history of onset almost entirely prevented mistakes occurring.

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DR. BARLOW.

Dr. Barlow said that he had listened with much interest to the discussion regarding the subject of diphtheria from the bacteriological standpoint, and the effect upon the disease by the treatment with serum from the immune animal. He was impressed by the apparent increase in number of recoveries when treated with the serum as contained in Dr. Glaister's tables. As, however, it had been stated that the diagnosis in the cases thus treated was made by bacteriological examination of material obtained from the oral cavity, and as, in the course of the discussion, members had referred to cases in which there was doubt as to the diagnosis until a bacteriological examination had been made, Dr. Barlow thought it was possible that all the cases thus diagnosed might not be genuine cases of diphtheria. Dr. R. M. Buchanan, at the end of his paper, had admitted that it was impossible to be quite sure about distinguishing the real bacillus that gave rise to diphtheria from the pseudo-bacillus. Then, Dr. Coats had said that the bacillus might be present and yet give rise to no symptoms.

Dr. Coats explained that that was in one who was convalescent from the disease. It was well known that, for many weeks after an attack, it was common to find bacilli in the throat, which were described as of inferior virulence, but Dr. Ruffer had mentioned to him a case in which he had examined the sputum of a boy who seemed to be perfectly well, and who must have been six or seven months from his attack of diphtheria, and yet virulent bacilli had been discovered.

Dr. Barlow asked how one could know that these were true diphtheria bacilli and not the pseudo-bacilli.

Dr. Coats replied that the distinction could be made by inoculation experiments.

Dr. Barlow said that, if this were necessary in all cases, he wished to ask if it had been done in connection with Dr. Glaister's cases.

Dr. Glaister replied in the negative.

Dr. Barlow asked what proof there was then that they were genuine cases, and not cases in which the pseudo-bacillus only was present.

DR. CHARLES WORKMAN.

Dr. Charles Workman referred to the question which had just been raised by Dr. Barlow. The subject, to his

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(Dr. Workman's) mind, was one of simply enormous difficulty. It was not only the case that the diphtheria bacilli were found in people who had passed through the disease, but they were not infrequently found, so far as he could tell from the literature of the subject, in the mucous membranes of members of the family who were not themselves suffering from diphtheria, when others in the house had been attacked. It was to be remembered that, in certain cases, the bacilli present were not diphtheria bacilli, but pseudo-bacilli, and this led to a further question. It was known that if true active diphtheria bacilli were treated under certain conditions they could be reduced to pseudo-bacilli, for they did not then produce the disease.

A great deal of light was still required from practical work and experiment, and Dr. Workman thought that the discussion, especially in its relation to treatment, was premature. The knowledge of the subject was not yet sufficiently accurate to warrant inferences being drawn from it.

DR. CARSLAW.

Dr. Carslaw said that, in view of Dr. Barlow's remarks, he desired to mention that, on more than one occasion, when the clinical diagnosis of diphtheria had presented great difficulty, he had submitted part of the exudation from the patients' throats to Dr. R. M. Buchanan, who had kindly undertaken bacteriological examination. As the result of his investigation, Dr. Buchanan had quite definitely given the opinion that certain of the cases had diphtheria, and his opinion had, in each instance, been confirmed by the subsequent progress of the case as observed clinically. In one family the patients were the mother and a girl of about 5 years. The mother's throat had presented merely the appearances of a follicular tonsillitis, and the child's, at the time of the bacteriological examination, had not differed sufficiently from that type to warrant more than a suspicion of diphtheria. Still, Dr. Buchanan had found, in the exudation from each throat (mother's and child's), evidence leading him to confidently express his opinion that the patients had diphtheria. The spread of the membrane in the child's throat had afterwards shown his diagnosis to be right.

Dr. Workman asked if inoculation experiments had been made in those cases, and, on Dr. Carslaw replying in the negative, added that there could not then have been positive proof, at the time of bacteriological examination, that the

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bacilli found were true diphtheria bacilli and not pseudo-bacilli.

Dr. Carslaw said that nevertheless Dr. Buchanan had been able to make the diagnosis.

Dr. HECTOR C. CAMERON.

Dr. Hector Cameron spoke of a point which had been referred to by Dr. Chalmers—viz., the diagnosis, from diphtheria, of what used to be called "croup." When he began practice as a surgeon, and was asked to perform tracheotomy in children who were asphyxiated, the diagnosis was made easily and satisfactorily to the physician's mind. In patients under 14 years of age, the disease was called "croup," when there was laryngeal difficulty and no membrane was visible in the throat. "Diphtheria" was very much the same, *plus* a membrane. In Dr. Chalmers's table, probably "croup" and "diphtheria" must be understood in this light. In the days to which he had referred, there was a third group recognised —laryngeal inflammation and fatal asphyxia in patients who were more than 14 years of age; that was certified as "laryngitis." He remembered a case in which the patient was a woman, pregnant, and near full term. He had found her livid, and operated without chloroform. She had rallied, but next morning labour had come on, triplets being born, and the mother sinking after severe hæmorrhage. In the death certificate the term "laryngitis" had been used, but within ten days all her children had sickened of diphtheria. If she had been under 14 years of age, they would have spoken of her condition as "croup." Similarly cases had often been called "croup," in which paralysis, albuminuria, &c., at later stages showed that they had been dealing, not with membranous croup, but with diphtheria.

As to drainage, Dr. Cameron was quite certain that one habitat of diphtheria was in unhealthy houses; and he had seen, not once, but over and over again, diphtheria with scarlet fever; sometimes with pneumonia; sometimes with enteric fever; and, in one case, all four in one house within eighteen months. This was true of all diseases dependent on pathogenic micro-organisms (tuberculosis, diphtheria, &c.): that an unhealthy house acted as a predisposing cause. He had referred to this subject in his Presidential Address.[1] Its importance would be recognised when it was remembered how often one was asked, in the witness-box, some such question

[1] See *Glasgow Medical Journal*, 1894, vol. i, p. 377.

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as this:—Given that this house was in a bad state of drainage, do you think this is likely to have had any direct bearing on the occurrence of diphtheria?

DR. WALKER DOWNIE.

Dr. Walker Downie said that, as there was great dearth of evidence of the use of the antitoxin, he might mention his experience of that remedy. He had not had a very large experience. In all the cases in which he had used it, he had been called in for the express purpose of performing tracheotomy, and it had only been after thus relieving the urgency of the symptoms that the injections had been made.

In the first case, there had been laryngeal obstruction within forty-eight hours of the onset of symptoms; in the second, the laryngeal difficulty had occurred ten days, and in the third, fourteen days from the onset. In the second and third, the patients had been very much exhausted. In none of the cases had the temperature been remarkably high, so that there could not be the marked reduction usually described. He had not been able to discover much improvement after treatment beyond what usually followed the successful performance of tracheotomy. No one could be better pleased than himself should this serum from the immunised horse prove to be a specific in the treatment of diphtheria. In the experimental stage it was well to be able to assure all that the remedy, if administered with due precautions, can be given with impunity. Such assurance would encourage men in general practice to give it at the earliest possible moment with a greater hope of a successful issue.

In his first case the patient had been comatose at the time of operation, and recovered. The others had died; but, as mentioned, they had already been much exhausted. When gathering statistics, too much reliance could not be placed upon one man's figures, because one epidemic of diphtheria was often more virulent than another. For example, in an epidemic at Hendon, which he had investigated at the instance of the Local Government Board, the mortality had been very high; in others he had known, it had been small. Individual experience must not, therefore, go for much. A further illustration of this point might be mentioned. During last autumn he had seen six cases of diphtheria in one house. The first patient, a child of 6 years, was comatose when he operated; but at the end of a week the tube was removed, when the child, who recovered, was virtually well. One of

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the six patients died, at the end of two months, from paralysis; but all had recovered from the initial illness. At that time he had had no serum. If he had had any, he would, no doubt, have used it, and the recoveries might have been put down to the serum treatment. They had, however, occurred apart from it.

DR. SERVICE.

Dr. Service (of Mossend) said that his material for contribution to the discussion was meagre, but that he could report one case in which he had used the serum. Its effect in this particular case seemed to him to be so striking that he would relate the details. The patient had been seen with a neighbouring practitioner who, knowing that he had a supply of the serum, had sent him an urgent message asking him to come at once, as tracheotomy might have to be performed. He had found the patient to be a girl of 9 years, half sitting up in bed, with that peculiar far-away look and ashen appearance of the face which those who had seen much of the disease knew to mean that the case was a bad one. She had marked dyspnœa, the intercostal spaces being indrawn. The temperature had been only over 100°, but it was well known that in diphtheria the degree of feverishness varied greatly. There had been no albuminuria. The pharyngeal space had been seen to be filled with very nasty-looking membrane, the tonsils and uvula being covered. The cough had been characteristic of the so-called "croupous" variety. There had been no time to get a bacteriological examination made.

Dr. Service had injected at once the whole contents of a bottle of Behring's serum, and next morning it had been found that there had been no constitutional effect, but that the pharynx was clear, although the breathing was still laboured. They had then injected 6 drachms of the serum supplied by the British Institute of Preventive Medicine. The mother had subsequently reported that soon afterwards the child had coughed up a piece of membrane "like a cigarette" (she had been directed to burn all rags, &c., used about the mouth, and so had not kept the specimen). From that moment all symptoms had disappeared.

As to drainage, he might say that in Seville, where he had practised for some time, there was practically no such thing as drainage, the usual plan being to have a 50 feet deep well under the house, in which all excreta were allowed to gather. The city had a population of 250,000, and the mortality was very low. While in Bilbao, where he had also resided, there

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was an extensive drainage system; but it was so defective that the smell of sewer emanations was intolerable both in the streets and the houses. There diphtheria was always present, and the mortality was high.

In answer to questions from members, Dr. Service added that in the case narrated above there had been practically no form of treatment employed other than the use of serum.

Dr. NEWMAN'S REPLY.

Dr. Newman, in his reply, insisted on the benefits which were to be obtained in the treatment of *early* cases of diphtheria from the antitoxic serum. He referred to various practical matters which had been brought up by other speakers in the course of the discussion. His opinions on the most important of these matters have already been introduced into the report of his original paper (*cf.* p. 50). Dr. Newman, in addition, mentioned that he had had, up till the date of this discussion, 29 cases of serum treatment, but that he was precluded from referring to these in detail, owing to the time limit having expired. He intends, however, to publish certain typical cases in the September number of this *Journal*.

Dr. R. M. BUCHANAN'S REPLY.

Dr. R. M. Buchanan, in reply, said that much of the discussion had had a bearing on the prevalence of diphtheria in relation to various apparent sources of the infection, such as transmission from animals, association with drains, and with school attendance. In connection with the communicability of the disease from animals to the human subject, the question was still in a state of some uncertainty. Before bacteriological examination became so exact, it was believed that communication of the disease took place from cats and fowls. Many epidemics of diphtheria have accordingly been recorded as originating in association with a membranous disease in those animals. Loeffler has pointed out, however, that, as a rule, the diphtheria of the lower animals is dependent on a microbe differing greatly from that of human diphtheria, and his observations have been confirmed by others. Klein had shown that the disease was easily communicated experimentally to the cat, and that the bacilli could be found in its lungs and in the membrane, but there were very few cases in which diphtheria bacilli had been found in the membranous disease acquired naturally by the cat.

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Dr. Buchanan held that diphtheria had a close relation to drains, in the manner explained by Dr. Chalmers—*i. e.*, that emanations from drains, and other insanitary surroundings, determined inflammatory affections of the throat, which paved the way for diphtheria. These predisposing influences were often observed in the distribution of a contaminated milk supply, and in houses which had an unhealthy history, as mentioned by the President.

In regard to the transmission of the disease from individual to individual, it had to be borne in mind that the diphtheria bacillus had an extremely varied degree of virulence. It appeared to exist in the throats of individuals in a perfectly harmless condition, as tested on animals, but, both clinically and experimentally, it could be shown to regain its virulence:—

(1) In transmission from one individual to another in a family, or on a larger scale in an epidemic.

(2) In association with those sore throats. Here he need only refer to its frequent occurrence after scarlet fever and measles—conditions preparing the soil for the bacillus.

(3) By growing along with other micro-organisms — in particular, the streptococcus pyogenes. If one filtered a pure culture of the diphtheria bacillus and of the streptococcus and mixed the filtrates, one did not get such a virulent poison as from filtering a mixed growth of the two.

Again, in any particular patient, as the disease was shading off, one obtained less and less virulent cultures day by day. The bacillus quickly lost its virulence, too, in sunlight, especially if with sunlight were associated humidity and high temperature.

It was important to remember, however, that the bacillus could be dried without losing its virulence, provided sunlight was excluded, and could withstand a high temperature for a time in the dried condition without detriment. For example, it might be killed by a temperature of a little over 40° C. if in the vegetative form, while, if previously dried, it would stand 90° C. for a considerable time. This fact was of importance in relation to the disinfection of rooms which had been occupied by diphtheria patients. Just as in cases of tuberculosis, cultures had been obtained from the dust of rooms months after the occurrence of the disease.

As to Dr. Barlow's question about the pseudo-diphtheria bacillus, he could only say that, without inoculation experiments, one had no absolute proof that the bacillus cultivated from a given case was the "true" one or the "false" one, but one had evidence nevertheless of the greatest practical value.

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Given a suspicious throat, if one obtained in the course of twelve to twenty-four hours, a culture presenting all the morphological characters of the bacillus of diphtheria, practical experience had shown that it could be accepted, without misgiving, as diagnostic of true diphtheria.

It was also a notable fact that the absence of the bacillus ("true" or "false") in cases, however like diphtheria they might be clinically, lifted such cases into a much more hopeful, and altogether less serious, category.

Dr. Coats asked if the pseudo-bacillus and the true bacillus were identical.

Dr. Buchanan replied that morphologically the pseudo-bacillus could not with any certainty be distinguished from the true bacillus. They differed in virulence, but it was impossible to say where the pseudo-bacillus ended and the true bacillus began.

Dr. Glaister asked if Dr. Buchanan then controverted Klein's view on the subject.

Dr. Buchanan replied that all bacilli showed variations in virulence and culture growth in relation to variations in the conditions of growth.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

Session 1894-95.

Meeting VI.—11th March, 1895.

The President, Dr. Knox, *in the Chair.*

I.—FEMALE PATIENT AFFECTED WITH ACROMEGALY.

By Dr. Middleton.

Dr. Middleton showed a woman, 34 years of age, suffering from acromegaly. She had been admitted into the Royal Infirmary complaining of pains in the head and loss of sight; but her physiognomy at once suggested acromegaly as the diagnosis. She had enlarged, coarse, heavy features, and the face appeared elongated. The superciliary ridges were not undnly thickened; the forehead, as a whole, rose abruptly from these ridges, and had even a tendency to overhang them.

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Around both eyes there was considerable puffiness, causing the eyes to look very small; this puffiness did not pit on pressure. There was no undue prominence of the cheek bones. The nose was large and broad, and the nostrils were dilated. The lips were much enlarged and everted; this was especially the case in the lower lip. The lower jaw was thickened, especially its mental portion. Many of the teeth were lost, especially in the upper jaw; so far as could be determined, there were no unusual gaps between the teeth. There was no increase in the size of the tongue; and the voice was low, but without other special quality. There was no hardening of the cartilages of nose or ears. There was some undue roundness of the cervico-dorsal region of the spine, but there was no general deformity of the thorax. The junctions of the costal cartilages with the ribs were in many cases enlarged, as was also the sternal end of the right clavicle. The hands presented a marked spade-like appearance; the interosseous spaces in both hands showed considerable atrophy of the muscles, but the thenar and hypothenar eminences were normal; the finger-tips were very "cushiony." The ends of the long bones and the joints of the arms were not affected. The feet were both markedly enlarged, and the toes had something of the bulbous character. There was nothing abnormal in the joints of the legs or in the pelvis. Beyond a general feebleness, there was no loss of muscular power, and sensation was unimpaired.

The patient dated her illness from the birth of her only child, three and a half years before. After her confinement, which was normal, she was in bed for five weeks on account of "excessive weakness;" but she could not recall having suffered from severe hæmorrhage, fœtid discharge, or fever. About six weeks after the birth of her child, she began to be swollen about the eyes, and, later, the whole face changed in appearance, the features becoming much larger, so that her friends remarked upon it. At the same time she began to suffer from pains in the head, most severe at a spot a little to the right of the middle line and 1 inch or so behind the sagittal suture. Since that time enlargement of the features had been gradual. In October, 1894, she began to have cutting pains in the left eye, and thereafter her eyesight rapidly became impaired; there was a good deal of lachrymation. Since her illness began she had also had weakness and pain in the lumbar region. She recognised that the hands and feet had become much enlarged. She had never worn gloves, so that the enlargement of the hands could not be estimated;

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but whereas three years ago she had worn No. 5 boots, she now required No. 7.

Menstruation had been regular till she became pregnant. A week after weaning her child she had a slight flooding, and since then she had menstruated only twice. There had been no leucorrhœa.

The lungs were normal, save for some small moist râles at both bases. The cardiac dulness was enlarged to the right, extending from the left nipple line to 1½ inch to the right of the middle line. The sounds were pure. The urine contained a little albumen, but no sugar.

The eyes were examined by Dr. Rowan, who reported as follows:—"At a distance of 12 feet she can simply see objects as shadows, and cannot distinguish persons. The pupils react to light and to accommodation, but sluggishly. Right eye: Optic disc pale on temporal side, and the edge indistinct; nasal side pink and swollen. Left eye: Optic disc pale and atrophic; pigmentary disturbance on the temporal side; veins enlarged and arteries small. No hæmorrhage in either eye. The field of vision could not be tested, owing to the puffiness about the eyes."

Dr. Fullerton reported as follows on the ears and throat:—"Hearing distance with watch 5 inches on right, on contact on left. Tuning fork heard best on left side. Rinne's experiment: Positive on right, negative on left. Right drum somewhat indrawn, with slight fibrous thickening in anterior segment. Left drum markedly indrawn; malleus almost disappeared; general fibrous thickening.

"Chronic catarrh of naso-pharynx. Vocal cords move freely and completely."

This patient was under observation for a few weeks only. During that time frequent records of temperature, pulse, and respiration were made. The temperature was generally subnormal, and never pyrexial; the pulse varied considerably, from 70 to over 100; and the respirations varied from 20 to 30. She was treated by thyroid tabloids, at first one and then two daily, and these had no apparent influence in any way. Her headaches were relieved by phenacetin.

Dr. Knox said that they were all indebted to Dr. Middleton for bringing forward this interesting case. The subject of acromegaly was one which he had made very specially his own, and there was no doubt that he was right in regarding the present patient as suffering from that disease.

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II.—PATIENT EXHIBITING MARKED MUSCULAR ATROPHY OF HANDS AND FORE-ARMS.

By Dr. R. Barclay Ness.

The notes of this case appear as an original article at p. 96.

Dr. Middleton had observed the case since admission to the ward, and could quite concur with what Dr. Ness had said. At one time he (Dr. Middleton) had been inclined to regard the condition as myopathic, and all the more so as there had been distinct improvement, the claw-like appearance and the atrophy having become less marked. Taking all things into account, however, he now thought that the balance of evidence was in favour of Dr. Ness's diagnosis.

Dr. Knox asked whether the fact that the patient had been playing so much on the pianoforte would not affect the question of the particular form of atrophy.

Dr. Middleton replied that that had been taken into account.

Dr. Charles Workman asked, as regards etiology, whether Dr. Ness thought that the disease was secondary to the prolonged muscular effort in pianoforte playing; and, as regards treatment, what form of electricity had been employed. As regards etiology, he would raise a further question—viz., as to there being any possibility of a syphilitic history.

Dr. Hawthorne quite agreed with Dr. Ness in his diagnosis, but wished to emphasise the question just raised by Dr. Workman as to syphilis, especially in respect to the patient's family history. He (Dr. Hawthorne) had shown a patient (a boy of 18 years) with progressive muscular atrophy to the Society during last session.[1] In that case a family history of specific disease had been obtained with some difficulty, but he thought that the evidence in favour of it had been conclusive, and that the presence or absence of a similar history might have an important bearing on the questions which had been raised in regard to Dr. Ness's case.

Dr. Ness, in reply, said that he did not know whether the pianoforte playing had really been a determining cause, but he thought it was a matter that should be taken into account; if the affection were due to that it would be more likely to be the simple myopathic form. He could not say whether or not there was a history of syphilis, as that question had not been entered into particularly.[2]

[1] See *Transactions of the Pathological and Clinical Society*, also *Glasgow Medical Journal*, 1894, vol. i, p. 69.

[2] Subsequent enquiry has shown that there is no reason to suspect the presence of any syphilitic taint.—R. B. N.

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Galvanism had been the form of electricity which had been chiefly employed.

Dr. Knox thought that it would do no harm to give antisyphilitic remedies.

Dr. Middleton said that even if there were a history of syphilis he hardly expected that they would do any good.

III.—PATIENT WITH LITTLE'S PARALYSIS.

By Dr. R. Barclay Ness.

W. B., aged 9 months, was brought up last week by the mother to the Dispensary of the Royal Hospital for Sick Children, where he was seen by Dr. Carslaw and myself. The mother brought the child up on account of a certain amount of "stiffness" in the arms, which prevented the child moving them about freely, and which interfered with the mother dressing and undressing him with ease.

On examining the case we came to the conclusion that it was affected with a form of spasmodic paralysis of infancy. The arms are the parts most affected, and are in a more or less rigid condition. Any attempt at passive movement increases this rigidity, while voluntary movement is very restricted. On looking at the hands, the fingers will be found firmly flexed on the palm, while the thumbs are inverted.

A certain amount of grasp, arising from the contraction of the muscles, enables the child to hold any little article placed between the fingers and the palm, but he cannot carry it to his mouth as is evidently his wish, judging from the way in which he turns his head downwards in the direction of the object.

On examination of the legs it will be found that there is a certain amount of rigidity present here, too, but not nearly to the same extent as in the arms; and this is rather the reverse of what usually exists in such cases, the legs being, as a rule, most, and the arms least, affected.

The rigidity present may be easily felt by grasping the ankles and slowly separating the extended legs. Some resistance will be felt, due to the spasmodic condition of the adductor muscles of the thigh. The mother, however, has never been aware of anything being wrong with the lower limbs, though she describes how the child stretches itself out so that the whole body, including the legs, becomes perfectly rigid, and it seems as if she seldom or never succeeded in getting the child to sit on her knee. The patellar tendon reflexes are exaggerated. This rigid condition of the limbs

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becomes more marked when they are handled, as, for example, when the child is being dressed; but another curious condition has been pointed out by the mother, and that is that any sudden and loud noise near the child induces irregular spasmodic movements of the arms, accompanied by similar movements of the head.

On examining the head there is found in the middle of frontal region an unnatural prominence, while in the left temporal region there is a depression much more pronounced than anything which exists on the right side. The anterior fontanelle is still patent, but only to a slight extent. The expression of the face is heavy and not altogether intelligent, though the mother says the child recognises both her and the father. Hearing and sight are normal.

The condition above described seems to have some direct connection with what took place at the birth of the child. The mother is 36 years of age, and this is her firstborn. The labour extended over a period of twelve hours or more, and delivery was ultimately accomplished by aid of the forceps. After birth the child remained in a state of suspended animation for over half an hour, after which respiration became established; but the child did not cry until after the lapse of about three hours. During the following day it lay motionless, being fed by the spoon. On the third day, those in attendance became alarmed, thinking the child was about "to take convulsions." This idea arose from their noticing a peculiar shaking of the child's head, turning up of its eyes, and a certain amount of stiffness in the arms; but, as far as one can judge from the history, no true convulsions occurred. It is from this time that the present condition dates.

This case seems to belong to a class to which v. Heine called attention in 1840, and which was fully described by Little[1] in 1853. The latter was the first to indicate the relation between this form of infantile spasmodic paralysis and certain accidents accompanying childbirth, particularly "asphyxia neonatorum," which he suggested gave rise to such general engorgement of the vascular system as to produce "capillary apoplexies," and even "larger apoplectic extravasations" in the brain and spinal cord. We have thus a cause suggested by Little to explain such a case as the one brought before your notice. Of course, he recognised in certain other

[1] *Transactions of the Obstetrical Society of London*, 1861, vol. iii, p. 293: "On the Influence of Abnormal Parturition, Difficult Labours, Premature Birth, and Asphyxia Neonatorum on the Mental and Physical Condition of the Child, especially in relation to Deformities." By W. J. Little, M.D.

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cases that injury to the brain may have been caused by mechanical compression; but in this case I do not think that the deformity of the cranium to which I have already referred is sufficient to account for any permanent injury to the brain. It is more likely that the spastic rigidity of the limbs is the result of intracranial hæmorrhage produced in the manner above indicated.

Others have described this affection of children under various other titles.[1] For example, Gowers, in his *Manual of Diseases of the Nervous System*, discusses it under the terms "Congenital Spastic Paraplegia" and "Infantile Meningeal Hæmorrhage," or "Cerebral-birth Paralysis."

Dr. Charles Workman said that it was evident that the child had a distinct mental defect. Although he was 9 months old he had not the appearance of intelligence that a child of 9 months should present. They were, of course, seeing the patient at an hour when he ought to be asleep in bed, but Dr. Ness had told them that even early in the day his appearance had been similar. As regards prognosis, Dr. Workman agreed with Dr. Ness that that would largely depend on the amount of improvement in mental capacity. He had seen children who had had convulsions and presented a very similar condition of arms and legs, but it had usually been a passing condition due to a temporary disturbance of the digestive tract, and he did not remember any case in which the arms had been so distinctly affected as apart from the legs.

Dr. Middleton spoke of Dr. Ness's case as being in line with one, if not with two, which he had himself shown to the Society at the November meeting.[2] Dr. Ness, like Dr. Middleton, had accepted Little's pathological explanation of the conditions present in the disease associated with his name, but at the former meeting some of the speakers had suggested that these conditions did not result from the accidents of labour, and that the disease was a congenital affection. The more he had thought and read of the subject since, the more had Dr. Middleton come to feel that Little was right; and that the cause was to be found in the disturbance of the brain in asphyxia neonatorum, although, of course, the disease did not necessarily occur in every case of asphyxia neonatorum. The prognosis was very bad indeed, both as to movement and as to the mental condition; this was

[1] *Vide Glasgow Medical Journal*, July, 1892, note on Infantile Spasmodic Paraplegia, by Walter K. Hunter, M.B., B.Sc.

[2] See *Transactions of the Pathological and Clinical Society*, also *Glasgow Medical Journal*, 1895, vol. i, pp. 68, 71.

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well illustrated in the histories of his patients referred to above.

Dr. Hawthorne, without pretending to be able to offer an opinion on the general question of the pathology of Little's paralysis, said that there was one aspect of the present case which made it difficult to think that the conditions had resulted from a hæmorrhagic lesion, and that was the fact that the affection was a symmetrical one, and involved specially the upper limbs. This would seem to indicate that, if there had been hæmorrhage, there must have been two (symmetrical) hæmorrhages. In ordinary Little's paralysis he thought that the lower limbs were chiefly affected, and a single hæmorrhage could then be more readily understood as the cause. Dr. Ness's case was thus an important one as bearing on the question as to whether Little's paralysis was due to hæmorrhage or not.

Dr. Ness, in reply, said that his only doubt had been as to whether the deformity of the skull had anything to do with the condition of the limbs or not, but he did not think that that deformity was so extreme as to make one regard it as the cause. When Little had written on the subject, he had not had opportunity of proving the correctness of his views by *post-mortem* examinations, but this had subsequently been done by an American. As Dr. Hawthorne had said, in most of Little's cases the paralysis had been chiefly in the lower limbs, but in two-thirds of Gowers' cases the upper limbs were likewise affected. In the present case there was only a difference of degree, because the lower limbs were affected to some extent. Dr. Ness thought that the lesion was most probably hæmorrhagic.

IV.—PATIENT WHOSE KIDNEY HAD BEEN DRAINED FOR PYONEPHROSIS.

By Dr. Fleming.

Dr. Fleming showed this patient, and gave an account of her case, which is contained in the following detailed report:—

J. G., æt. 27, married, housewife.

History.—2nd July, 1893.—Gave birth to a child. Labour instrumental.

17th July.—Had some family troubles, after which she had an attack of puerperal mania, and was sent to an asylum.

3rd August.—Admitted to City Hospital, complaining of swelling in abdomen. On admission, there is a smooth, rounded, elastic, and firm swelling on left side of abdomen,

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extending from lower ribs to pubis internally, reaching to the middle line. Urine contains pus. Temperature—morning, normal; evening, 101·6°.

19th August.—Pus in urine began to diminish and tumour to enlarge. Quantity of urine varies from 43 oz. to 65 oz. per diem.

30th August.—Tumour extends beyond the middle line. Copious sweats at night. Hypodermic needle introduced into swelling in lumbar region, and pure pus obtained. Temperature—morning, normal to 101°; evening, 103·6°.

31st August.—Operation: incision as for lumbar nephrectomy. Small quantity of pus found lying outside the kidney. Kidney pressed into wound from the front, and incised. About half a gallon of pus escaped. Under tension, kidney substance found to be converted into several large communicating cavities. Tubes inserted. Wound left open.

1st September.—Temperature—evening, 99·6°. Urine, 21 oz.; dark colour; contains blood and 1½ oz. pus. Wound dressed; purulent discharge.

3rd September.—Urine, 33 oz.; no blood. Slight deposit of pus. Temperature, 98°. No night sweats. Little discharge from wound.

4th September.—Discharge of urine from wound.

13th September—Temperature normal. Urine nearly normal.[1]

14th December.—Admitted to Ward 18, Royal Infirmary.—On admission, there is a sinus in region of left kidney which is discharging copiously; discharge contains urea. Urine, 1020. Albumen; no blood; no sugar. Microscopic examination: pus.

26th December.—Drainage tube inserted into wound.

24th January, 1894.—Urine, average, 30 oz. Cavity discharging. Dismissed.

13th April.—*Readmitted.*—General health improved. Complains of pains in left lumbar region, shooting down in direction of ureter. There is general distension of abdomen. On palpation, there is a firm, irregular mass occupying left lumbar region, and extending somewhat into left iliac region. This is dull on deep percussion. The wound before referred to is still discharging, but discharge is less than it was when patient left Infirmary on 24th January. Urine—straw colour; opaque, with white deposit; 1015; acid. Albumen abundant. Pus present and blood. No sugar.

29th April.—*Operation.*—Opening made in left linea

[1] I am indebted to Dr. Johnstone for copious notes of the case when in the City Hospital, from which the above is taken.

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semilunaris. Kidney found disorganised, and fused with other tissues. Anterior incision closed.

25th May.—Anterior wound healed. Posterior discharging as much as ever.

3rd July.—Direct communication made between abdominal and lumbar openings, and tube put through.

16th July.—Dismissed much improved.

11th January, 1895.—Readmitted. Tube was removed five weeks after leaving in July, 1894. General health and appearance have improved greatly. Both abdominal and lumbar sinuses are discharging freely. Fluid can be forced from one to the other with difficulty. On probing by lumbar opening, a grating surface is felt.

28th January.—Operation.—Sinuses enlarged and cavity scraped. Several calcareous masses removed. Urine—acid; amber; no deposit or cloud. Albumen, one-sixth.

10th February.—Discharge slight. Cavity rapidly filling.

13th February.—Dismissed.

9th March.—Urine, 45 oz. per diem; acid; amber; 1015; deposit of mucus; albumen, one-sixth; no blood; no pus. Abdominal walls are lax. Percussion normal over whole abdomen. No thickening in left lumbar or iliac regions. Anterior sinus closed. Posterior sinus discharging. A probe can be introduced into the latter for a distance of 2½ inches. General health good.

The discussion on this case was taken with that which follows.

V.—SPECIMEN OF KIDNEY EXCISED FOR PYONEPHROSIS ORIGINATING FROM CALCULUS.

By Dr. Fleming.

Dr. Fleming was unable to bring this patient to the meeting on account of her chest condition. He showed the excised kidney and submitted the following report of the case:—

Mrs. M'L., æt. 28 years, "dealer," admitted to Ward 18, Royal Infirmary, 13th February, 1895.

History.—Five weeks before admission patient began to have pain in abdomen, and noticed a swelling on right side of abdomen. She remembers shivering a little about this time. The onset of the symptoms was gradual. Since that time the pain has increased in severity, and the swelling has become larger. Her urine, since the commencement of symptoms, has been very white in colour and rather strong odour. Bowels

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have been constipated. About a week before admission began to vomit after food.

Previous History.—Has had five children. Last child born three months before admission. Labour easy; puerperium normal. Has had greyish spit for some time, but no cough.

Family History. — No history of tubercular disease can be got.

On Admission. — 13th February.—Patient is emaciated, and with hectic flush of cheeks. There is a swelling in right lumbar and umbilical regions. This is painful, and on manipulation is very tender. On palpation there is a somewhat globular swelling situated in regions mentioned. Surface of swelling is smooth and rounded. Fluctuation is easily obtained. On percussion there is dulness over swelling, which is continuous with liver dulness, and extends into the flank. It reaches as far inwards as the middle line, and downwards to a level about 1 inch below umbilicus. Urine—acid; yellowish, 1025, opaque; deposit of pus one-third of specimen. Albumen abundant. Microscopic examination—pus cells; no tube-casts. Patient has phthisis; sputum nummular.

15th February.—Fluctuation can be obtained from above downwards, and an impulse can be transmitted into the loin from before backwards, but there is no bulging in the loin.

18th February.—Operation.—Under chloroform and subsequently ether, an incision about 4 inches long was made in the right linea semilunaris, and another short one at right angles to it, outwards. On dividing the peritoneum the tumour presented in the wound, displaying a white glistening surface from the posterior reflection of the peritoneum. The other kidney having been palpated and appearing normal, the bowels were kept back by a sponge, and the peritoneum covering the tumour incised. The tumour was freed to a considerable extent from the anterior adhesions, which were very firm. During the separation of the adhesions behind, a rupture took place in the wall of the sac on the postero-external surface. A very large quantity of yellow pus was freed and escaped under considerable tension; probably none entered the peritoneal cavity. The remainder of the capsule was then freed from its adhesions and the whole kidney removed. It was found impossible to isolate the ureter from the blood-vessels at the hilum, and the whole mass was ligatured. The cavity was washed out, a glass drainage-tube inserted, and the wound stitched. After the operation the shock was slight, and patient recovered rapidly. Temperature normal.

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19th February.—Patient looking well; pulse regular and fairly strong; temperature, 99·2°. Urine, 24 oz. Dressed; drainage-tube removed.

20th February.—Urine—acid, amber; no cloud; deposit of urates and a little pus; 1020; no blood. Microscopic examination—pus cells and amorphous urates. Passed wind; no pain or distension of abdomen.

24th February.—General condition good; cough rather troublesome. Getting increased diet (tea, porridge, milk, Valentine's jelly.) Urine—acid; 1010; amber; deposit of phosphates; no albumen. Microscopic examination—a few scattered pus cells.

28th February.—General condition still improving. Cough less frequent and severe. Bowels moved with enema. Convalescent diet.

4th March.—Dressed. Wound healed.

7th March.—Bowels moved twice with castor oil; sitting up in bed.

Dr. Fleming added that the two cases which he had just described were at first as nearly as possible similar in their conditions. The patients were both young women, and their illnesses, besides being of similar nature, had both begun after childbirth. One case had, however, been admitted after the kidney had been drained, whereas the other had been admitted before any operative interference had been undertaken; in the former, even by the same incision as had been used successfully in the latter, they had been unable to effect removal, the result of the first incision having been to cause in the interval such alterations in what of the kidney had been left that it had been impossible to tell the relationship of parts. In the second case, though the operation had been a more formidable one, the conditions as regards the affected kidney had been completely recovered from, and the other kidney seemed to be doing its work well. *In re* the kidney, the second patient was in a much better condition than the patient whose kidney had merely been drained, and this encouraged one to choose excision as a primary operation. The difficulty of excision was such, that unless he had made out the relations of parts before the rupture took place (in the second case), Dr. Fleming was not sure that he would have been able to complete that operation. It was difficult as it was, but he thought it would have been impossible if the kidney had first been drained. He brought up the cases together in order that the contrast might impress them with the advantage in future

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cases of removing an affected kidney at once, rather than first draining and then attempting removal.

Dr. Knox agreed with what Dr. Fleming had said as to the moral to be drawn from his cases. He thought that in pyonephrosis, when the kidney had been so acted on as was shown by the enlargement in the second case, and by what must have been the enlargement in the other case, excision was the proper treatment. Dr. Fleming's remark about pyonephrosis coming after childbirth reminded him of one of his cases in which that had taken place. He had seen the patient with a medical friend in the country. The diagnosis had been of abscess, connected with parturition and coming up from the pelvis. Dr. Knox had readily determined that she had a pyonephrosis, and it had turned out that there had also been cystic degeneration of the kidney. He had shown the specimen at one of the Societies. The treatment adopted had been complete extirpation, and the patient was still alive five and a half years after operation. This was the more instructive when one remembered that cystic degeneration usually affected both kidneys, so that in this patient's case there had probably been complete extirpation of one kidney with an enfeebled kidney left. He had one case of complete extirpation alive and well eight years after operation, the only affection that the patient has since complained of being an attack of pain regarded as renal, and believed to have been due to the passage of a small stone from her other kidney. Dr. Knox was reminded also of a young man whose kidney he had removed in the Royal Infirmary. Five calculi of good size had been found in it. The patient had come back recently and asked for a certificate that his kidney had been removed; he looked so well that no one would believe that such an operation had been performed upon him. Such facts bore out the contention that one kidney, if fairly well, would keep a patient in good health so far as the renal function was concerned. It was a great pity that in Dr. Fleming's first case the kidney had not been excised, because the difficulty of closing such a sinus was well known to be very great.

VI.—CARD SPECIMEN: MUCOUS CAST PASSED *PER RECTUM* BY A PATIENT SIX MONTHS PREGNANT BUT OTHERWISE WELL.

By Dr. Carslaw.

Its considerable length (about 14 inches) and narrow calibre render this cast more than usually worm-like. It was obtained from a patient of Dr. Carswell's, a female about 30,

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six months pregnant. She had had no abdominal pain or tenderness, and no disturbance of the bowels except some slight tendency to constipation. A few months previously she had a discharge from the rectum of glairy mucus with some shreds, which, however, were not nearly so large as the present specimen.

CURRENT TOPICS.

GLASGOW ROYAL INFIRMARY.—APPOINTMENTS.—Dr. John Lindsay Steven and Mr. J. H. Pringle have been appointed respectively, Physician and Surgeon to the Infirmary, in room of Dr. Wallace Anderson and Dr. Fleming, whose terms of office had expired. Dr. Charles Workman has been appointed Pathologist and Curator of the Museum, offices vacated by Dr. Lindsay Steven on his appointment as Physician. The following appointments to the Dispensary have also been made—viz., Drs. J. W. Allan and W. K. Hunter, extra Assistant Physicians, and Dr. Luke, Assistant Surgeon, in room of Dr. Pringle, appointed Surgeon. These changes in the Staff leave two offices still to be filled up—viz., those of Assistant Pathologist and extra Assistant Surgeon. The changes in the Infirmary Staff have led to the following appointments in Queen Margaret College:—Mr. J. H. Pringle has been appointed Lecturer on Surgery, and Dr. Workman Lecturer on Pathology.

UNIVERSITY OF DURHAM.—DEGREES FOR WOMEN.—A supplementary Charter, by warrant, under the Queen's sign manual, has been granted to the University of Durham. This Charter enables Convocation to grant to women any degrees, excepting only degrees in divinity, which they have the power to grant to men. The degrees of the University of Durham in medicine, science, arts, literature, and music are, therefore, now obtainable by women. The Medical and Science Faculties are located in Newcastle-upon-Tyne, the former in the College of Medicine, and the latter in the College of Science, where women students can receive instruction in the various subjects of these two Faculties. The first woman graduate—Miss Ella Bryant—received her degree of Bachelor of Science at the meeting of Convocation, held in Durham, on 24th June last.

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UNIVERSITY OF GLASGOW.—The following is the list of degrees conferred on 25th July, 1895:—

DOCTORS OF MEDICINE (M.D.)—I. *With Honours.*—Thomas Kirkpatrick Munro, M.A., M.B., C.M., Scotland (*Thesis*—"Essays in Neurology: Historical and Clinical.")

II. *With Commendation.*—Charles Banks, M.B., C.M., Scotland (*Thesis*—"Observations on Epidemics of Cholera in India, with Special Reference to their Immediate Connection with Pilgrimages"); Andrew Lees Bell, M.B., C.M., Scotland (*Thesis*—"The Influence of a Previous Sire, and its Relation to Maternal Impressions"); Finlay Stewart Campbell, M.B., C.M., Scotland (*Thesis*—"Paroxysmal Hæmoglobinuria: its Treatment, with Special Reference to the Arrest of the Paroxysm by Quinine"); John Charles, M.B., C.M., Scotland (*Thesis*—"A Contribution to the Meteorology of Sporadic Pneumonia"); John M'Gregor, M.B., C.M., Scotland (*Thesis*—"On Paralysis following Diphtheria in Children.")

III. *Ordinary Degree.*—Peter Gardiner, M.B., C.M., Scotland (*Thesis*—"Malaria"); Archibald Gilchrist Hay, M.A., M.B., C.M., Scotland (*Thesis*—"Notes on the Symptoms attending the Induction and Maintenance of Chloroform Anæsthesia"); Thomas Thornton Macklin, M.B., Scotland (*Thesis*—"The Climate of the Isles of Scilly, with Special Reference to their Suitability as a Health Resort"); James Merry Macphail, M.A., M.B., C.M., England (*Thesis*—"Five Years' Practice among the Village Population of India, with an Analysis of 10,865 Cases"); James Jenkins Robb, M.B., C.M., Scotland (*Thesis*—"Vomiting a Symptom in Disease: Its Importance in Diagnosis and Treatment"); James Smith, M.B., C.M., Scotland (*Thesis*—"Diphtheria, with Description of Cases, &c."); James Allan Wilson, M.B., C.M., Scotland (*Thesis*—"The Treatment of Diphtheria by Antitoxin, with Notes of Cases.")

BACHELORS OF MEDICINE AND MASTERS IN SURGERY (M.B., C.M.)—I. *Honours.*—Joshua Ferguson,[1] M.A.; Henry Alexander Pattullo; Ernest Alexander Walker, M.A.

II. *High Commendation.*—William Scobie, B.D.; Alexander Hamilton Stewart, Robert Howie, Henry Allan Watson, M.A.; William Henry Lang, B.Sc.; Archibald Young, B.Sc.

III. *Commendation.*—Robert Brownlee Barr, Alexander Stevenson, Samuel Donaldson Cowan, M.A.; William Lawson, Farquhar Macrae, Robert Mackechnie Fraser, M.A.; Emmeline Marie Stuart, Robert King Miller, Malcolm Watson, John Lindsay Anderson, Adam Cubie Muir, Thomas Bell, Frederick Burdett Cormick, George Mowat, William Duncan Miller, William Alexander, James M'Cash.

IV. *Ordinary Degrees.*—John Carson Abbott, James Adam, William Allan, Arthur Roland Anderson, John Anderson, John

[1] Mr. Ferguson gains the Brunton Memorial Prize of £10, awarded to the most distinguished graduate in medicine of the year.

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James Stevenson Anderson, Thomas Armstrong, William Stephen Baird, Francis James Barker, M.A.; Alexander Blair, Henry Albert Böedeker, William Burns, Thompson Campbell, Vivian Ernest Chang, William Clow, M.A., B.Sc.; John Cumming, Henry Davies, John Divine, William Donaldson, Matthew Dunning, Richard John Edwards, Samuel English, James Findlay, William David Findlay, Albert Alfred Finkelstein, James Liddell Forrest, James Forster, James Reid Foulds, Andrew Fleming Galloway, Thomas Cleator Garrett, John Gillan, M.A.; Walter Graham, William Grove, William Hay, B.D.; Arthur Holt, Albert Barnes Hughes, James Jack, John William Jackson, George Jubb, David Kerr, William James Kerr, David Connor Kirkhope, John Kirkwood, David Lewis, John Dunlop Louttit, James Andrew Dixon Mulholland, Donald Munro, Daniel M'Coll, William Milligan M'Cormick, Duncan M'Donald, William Jones Mackinnon, Lewis MacLachlan, Hugh M'Laren, Moses Neil MacLay, William Macleod, George M'Pherson, M.A.; Archibald Russell Oliver, Edward James Primrose, M.A.; John Broadfoot Rae, John Rankin, John Neil Robertson, James Sandilands, James Smith, James Sproull, Hugh Stevenson, Alexander Stewart, James Stewart, James Stirling, Hugh Wright Thomson, Charles Kirk Toland, Frederick Wolverson.

NEW DRUGS, PREPARATIONS, &c.—*Anti-Diphtheritic Serum.*—*Messrs. Burroughs, Wellcome & Co.*, have forwarded to us a tube of dried serum, in the form of golden scales. We have had no opportunity, as yet, of testing the value of this preparation, but if in this form the serum should prove as efficient as the liquid antitoxin, its advantages to the practitioner are obvious. We append quotations from the letter of the firm accompanying the specimen:—"We were the first to prepare anti-diphtheritic serum in this active, portable, and permanent form, possessing the *full potency* of the liquid serum. The therapeutic activity of the contents of each tube of this dry anti-diphtheritic serum (B., W. & Co.) is attested by the medical director in charge of our bacteriological laboratory, and guaranteed by us. This dried serum is freely soluble in about twice its volume of cold water. The contents of the tube represent ten cubic centimetres of the normal liquid anti-diphtheritic serum, and it is customary to dissolve this quantity in ten cubic centimetres of cool water which has been previously boiled. We guarantee this form of the serum to keep for any reasonable period under ordinary conditions—a great advantage over the ordinary fluid serum, which is very difficult to preserve for any length of time. Anti-diphtheritic serum exsic (B., W. & Co.) is supplied in 1 gramme tubes at 1s. per tube."

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Messrs. Oppenheimer, Son & Co., Ltd., inform us that they have been appointed sole wholesale agents for the supply of the various serums prepared at the Pasteur Institute, Paris, and are in a position to supply the diphtheria antitoxin, tetanus antitoxin, and other serum remedies to the medical profession, in carefully and hermetically sealed sterilised bottles at Paris prices, suitable for export to the tropics or for use in Great Britain and Ireland. They will forward full particulars of the serums they are prepared to supply, together with prices for same, to any of our readers who may apply to them.

Carnrick's Peptenzyme.—The Peptenzyme Company, of 25 Alfred Place West, London, S.W., send us specimens of this new digestive preparation, which, if the account given of it be accurate, is well worthy the trial of physicians seeking for aids to digestion in all cases of stomach trouble and dyspepsia. The preparation may be obtained in three forms, an elixir, powder, and tablets, and full instructions as to dose, &c., accompany each form of the preparation. They are all very pleasant to taste, and patients should experience no difficulty in taking them. The Company have sent us a number of pamphlets, which our readers can obtain for themselves, and in which the methods of preparation are clearly stated, and the theories of digestion underlying the mode of preparation are set forth at length. Some of the physiology of the pamphlets is, perhaps, not beyond question. Mr. Carnrick has certainly a new theory, but our readers who are interested can judge of this for themselves. We refer especially to Mr. Carnrick's views as to the function of the spleen, and as to dried animal cells "retaining their vitality unimpaired, and, like a dry grain of wheat," renewing their functions as soon as brought in contact with moisture and warmth, and resuming their digestive activity and the development of the latent ferments in the digestive tract, as though their original existence had never been interrupted by the slaughter of the animal. The Company claim that a careful and critical examination of peptenzyme will fully demonstrate all its claims, and wish to insist specially upon the following point, and with this quotation we leave the matter to the judgment and experience of our readers, viz., "That this preparation of peptenzyme represents all of the digestive glands, whereas no other represents more than two, and that these glands are extracted from the animal mechanically, and are not killed by a treatment of acid the same as the glands from which pepsin is made and placed on the market."

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Messrs. Fraser & Green, our well known Glasgow chemists, have sent us specimens of *Karswood Creosote*, a new inhalant which can be sprinkled in doses of from 15 to 20 drops on a large pocket kandkerchief, and which, used in this manner, is said to give great relief in bronchial and nasal affections. The creosote is neatly put up in "drop" bottles.

Lactopeptine.—Mr. John Morgan Richards, the proprietor of this well known and popular remedy, informs us that he has now prepared the drug in *tablet* form, which should considerably enhance its convenience to patients. In its new form this useful drug should be of great service to those who require it in a portable form.

REVIEWS.

The Galenical Preparations of the British Pharmacopœia. By C. O. HAWTHORNE, M.B. London: J. & A. Churchill. 1895.

THERE is no scarcity of works on practical pharmacy; the student's difficulty is not that of finding a text-book on the subject, but rather that of selecting, from the many which claim his attention, one which shall be really of practical service to him. This may suggest the idea that it is an easy matter to arrange the data of pharmacy, as presented in the *British Pharmacopœia*, in such a fashion as to give the student a coherent and intelligible notion of their underlying principles. Those who have tried it know better, and Mr. Hawthorne is to be congratulated on the marked success with which he has overcome this difficulty. He has not only rendered this usually somewhat repellant subject attractive, but has presented it in such a way as to make it valuable, not only to the student, but to the practitioner. Mr. Hawthorne's position in teaching his subject is marked by sound and rather unusual common-sense. Whilst the student "may reasonably be expected to be acquainted generally with the materials used as remedies, and with the principles of the processes by which preparations suitable for employment in treatment are obtained, he cannot be expected to be familiar with drugs in their commercial aspect, or to burden his memory with details—quantitative or otherwise—of all their preparations. Important as these details are to the manufacturing pharmacist,

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they are of purely subordinate interest to the physician." The most suitable text-book, therefore, for the medical student is that which shall simply explain the nature of the official preparations, and the principles which regulate their manufacture, without actually providing a manual of practical directions for their successful production. This is an attitude which will commend itself, not only to the sadly-burdened student of medicine, but also to the majority of teachers and examiners; it hits the happy medium between the view which would recommend a detailed and ponderous text-book, which might well serve as a laboratory guide to the manufacturing chemist, and that which finds its expression in brief, but bald and absolutely uninteresting, aids to memory. As the result of a careful examination of Mr. Hawthorne's book, we feel bound to say that we know of no work which so exactly meets the requirements of the student of medicine. It is almost a pity it appears just on the eve of this year's re-issue of the *British Pharmacopœia*, which will doubtless be a very different book from its predecessors.

A Pictorial Atlas of Skin Diseases and Syphilitic Affections, in Photo-Lithochromes from Models in the Museum of the Saint Louis Hospital, Paris. With Explanatory Woodcuts and Text. By ERNEST BESNIER, A. FOURNIER, TENNESON, HALLOPEAU, DU CASTEL, with the co-operation of HENRI FEULARD, Curator of the Museum, and LEON JACQUET. Edited and Annotated by J. J. PRINGLE, M.B., F.R.C.P. Part I. London: F. J. Rebman. 1895.

IF the succeeding parts of this atlas are to be similar to Part I, now before us, we have no hesitation in cordially recommending it to the favourable notice of our readers as one of the finest dermatological atlases with which we are acquainted. Part I is sent out to the world with the good wishes of such eminent British dermatologists as Jonathan Hutchinson, Malcolm Morris, Stephen Mackenzie, J. J. Pringle, Colcott Fox and others, and it is well worthy of their commendatory remarks. Perhaps no subject in the whole range of medicine lends itself more readily to the pictorial art than that of skin diseases, and the four coloured plates (photo-lithochromes) accompanying the present fasciculus are most beautifully and faithfully executed. From the publisher's preface we learn that the atlas is intended as a pictorial representation of several of the famous models of dermatological and syphilitic cases at the Saint Louis Hospital of

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Paris, and that it will differ from most atlases of similar character in giving typical cases of common diseases, rather than illustrations of rare cases only. The latter object is one with which we have every sympathy, and hope that, for the sake of general practitioners, it will be faithfully carried out.

The museum of the Saint Louis Hospital is now about thirty years old, and originated with the offer of Devergie, leaving the Hospital after twenty-five years' service, to present, for exhibition in the Hospital, a series of water-colour drawings of skin diseases which he had had painted for teaching purposes. Accommodation was found for the exhibition, and pictures from other observers were soon added. It was felt, however, that carefully executed coloured models were more illustrative, and after a time the services of M. Baretta were engaged for the Hospital. The first models from M. Baretta's hands date from 1867, and since then he has gone on adding to the collection, till now the museum boasts 1800 examples of his work. These models have obtained a world-wide reputation, and it is mainly for the purpose of pictorially representing these that the present atlas has been originated.

The subjects dealt with in Part I are lupus vulgaris of the centre of the face—model by Baretta, letterpress by Besnier; dermatitis herpetiformis (Duhring)—model by Baretta from a patient under the care of Tenneson; syphilitic chancres of the external genitals in women—models by Baretta, letterpress by Fournier; patchy purpuric erythema (purpura hæmorrhagica)—model by Baretta, letterpress by Feulard.

The letterpress is excellently written, and the appreciation of the coloured plates is much facilitated by illustrations in black and white with explanatory letters, referred to in the text. In every respect the editors and publisher are to be complimented on the excellence of the work, to which we wish every success.

Syphilis. By ALFRED COOPER, F.R.C.S. Second Edition. Edited by EDWARD COTTERELL, F.R.C.S. London: J. & A. Churchill. 1895.

THE first edition of Mr. Cooper's work, published ten years ago, gained for itself, and has retained, the reputation of being a full and reliable account of syphilis in all its features. This, the second, edition, the joint work of Mr. Cooper and Mr. Cotterell, will still further enhance that reputation.

It is clearly written, well arranged, and fairly exhaustive. In addition to a full account of the symptoms, pathology, and

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treatment of syphilis, both acquired and hereditary, and of syphilitic affections of the individual organs and parts, there are chapters on the History of Syphilis in times past, on the Geographical Distribution of Syphilis, on the Ætiology of Syphilis, and on Syphilis in its relation to Marriage, Public Health, Insurance, and Insanity.

The illustrations, many of which are coloured, are specially good—are in fact so good as to be much more suggestive of the "atlas" than of a "treatise" published at 18s.

Text-Book of Diseases of the Kidneys and Urinary Organs. By Professor Paul Fürbringer; Translated by W. H. Gilbert, M.D.; with Commendatory Letter from Sir Thomas Grainger Stewart, M.D. Vol. I. London: H. K. Lewis. 1895.

It is quite obvious that Professor Fürbringer's book on *Diseases of the Kidneys* is well worthy of being translated into the English language. It is equally obvious that it deserves to have been translated into better English than the present volume has been. The style of the book is stilted, and German idiom has often been rendered literally into English. We frequently meet with "can be" where "may be" should have been used, and the following sentence, though in English, has a distinctly German flavour:—"Cliniaters and pathological anatomists have, since decenniums, sought to single a particular group out of the varied and numerous renal affections." We hope that, before publishing his second volume, the translator will submit his proofs to some one with a knowledge of English style, and so obviate what is a serious blot on a valuable work.

With regard to the matter of the volume we have nothing but praise to bestow. Fürbringer is well known as an able and original physician, and this is well shown in his treatise on the kidneys. His remarks on albuminuria are full of sound common-sense, and as regards the history of opinion upon this important matter, the information given is very full. The same remarks apply to his section dealing with Bright's disease. A clear and concise account of the history of our knowledge of the affection, and of the different controversies that have raged as to the unity or duality of Bright's disease, is given, and the sections on diagnosis and treatment are alike excellent. The work of the Glasgow School receives full recognition, and in the pages of the

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volume we recognise pretty frequently the names of a number of our townsmen.

We cordially recommend the volume to the careful study of all those who wish to approach the subject of renal diseases from a thoroughly scientific and historical point of view.

Handbook of Diseases of the Eye. By H. R. SWANZY. Fifth Edition. London: H. K. Lewis. 1895.

WE have so often reviewed this book favourably that it seems to us quite superfluous to do so at any length again. It is, without doubt, the best of all the smaller books on ophthalmic surgery, and is the one we have, for many years, recommended to our students. Mr. Swanzy is a clinician of the first order, and in this book he places at the disposal of his readers the results of his long and wide experience.

On one point we have always ventured to think Mr. Swanzy's book a little weak—*i. e.*, as regards refraction. A very large proportion of the students who nowadays take ophthalmic clinics have an excellent knowledge of optics, both as a branch of physics and of geometry. Anyone who is weak on these subjects need not attempt to teach the modern student, for he will not do it with credit to himself. Therefore, we think that this book would even be better than it is were more justice done to the optical portion.

We find that in glaucoma Mr. Swanzy still makes his iridectomy upwards. This he does in common with all ophthalmic surgeons. Some years ago we stated our conviction that iridectomy was most likely to be of use if made at that point at which the iris responded best to eserine. That opinion we still believe to be correct.

The Eye in its Relation to Health. By CHALMERS PRENTICE, M.D., Chicago. Bristol: John Wright & Co. 1895.

THIS book is ophthalmology run mad—it is simple nonsense; just as much so as the Count Mattei treatment of cancer. There is, however, this good point of difference, that Dr. Prentice has addressed the medical profession; the Mattei treatment, on the other hand, was boomed in such a manner as to do a cruel wrong to the suffering public, whilst filling with gold the pockets of the sellers of the blue and green electricities.

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We do not intend to insult the intelligence of our readers by any long criticism of rubbish. It may interest them, however, to know that the following diseases are due to defects in the visual centres, and are curable, for the most part, by prismatic corrections:—Ovaritis, prostatitis, uric acid diathesis, asthma, paralysis, hemiplegia, consumption, hay fever, Bright's disease, cirrhosis of the liver, sterility.

After that, nothing remains to be done but at once to consign the volume to the waste-paper basket.

A Manual of Gynæcological Practice for Students and Practitioners. By DR. A. DÜHRSSEN. Translated and edited from the Fourth German Edition by JOHN W. TAYLOR, F.R.C.S., and FREDERICK EDGE, M.D. Lond. London: H. K. Lewis. 1895.

THOSE interested in gynæcology, and especially those who follow German gynæcology only from translations, will find the present little volume most instructive.

It is thoroughly up to date, and the most modern improvements in operative gynæcology are described. Its claim, however, to being a manual for students cannot be sustained. Instead of the author making sure that the elements of the subject are clearly and concisely brought under the student's notice, he has attempted to make the work an exhaustive synopsis. As we have previously read the book in the original, we can speak highly of the present volume as a translation.

De la Puberté dans l'Hémiplégie Spasmodique Infantile: Notes et Observations. Par le DR. H. LEBLAIS. Paris: Progrès Médical. 1895.

WITH regard to our knowledge of spasmodic infantile hemiplegia, we are largely indebted to Bourneville and his pupils. In the pamphlet before us, Dr. Leblais, another pupil of Bourneville's, discusses certain of the secondary phenomena of that interesting disease. In the course of a brief description of its symptoms and pathology reference is made to the atrophy of muscles so frequently present, and this leads to a discussion of the nature of the atrophy, the conclusion arrived at being that it is not a degeneration, but simply an arrest of development. He then proceeds, on the basis of a careful examination of a considerable number of cases of this form of hemiplegia, to enquire into the developmental changes at

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puberty, and his results are formulated in the following conclusions:—

1. Atrophy of the testicle on the paralysed side is relatively frequent.

2. The development of hair on the body presents no characteristic abnormality, though it is sometimes greater on the sound than on the paralysed side.

3. The evolution of puberty and growth, apart from anomalies above noted, are effected in general just as in other children.

The *brochure* contains many interesting cases, but the number is too small to form the basis for general conclusions, as is apparent from the third one above noted, which would be controverted by many whose experience has been that such cases are generally defective in growth. As the cases are given in detail, they will be of great service to others working in the same field.

Infant Feeding by Artificial Means: A Scientific and Practical Treatise on the Dietetics of Infancy. By S. H. SADLER, Author of *Suggestions to Mothers*, &c. London: The Scientific Press, Ltd. 1895.

THE author of this book has certainly spared no pains to accomplish the object mentioned in the preface—the collection of information from standard text-books, and the quotation of authorities on the management of children. She looks upon her work "as the string which binds a rare nosegay of useful flowers (*i.e.*, facts) together." It may well be described as a "string"—a string of facts, not always well connected. We doubt if those in charge of infants will find it easy to get much practical assistance from such a mass of detail. It may be remarked, too, that it seems to be assumed, without protest, that children are not likely to be nursed by their mothers.

Diet and Cookery for Common Ailments. By a FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS and PHYLLIS BROWNE. London, Paris, and Melbourne: Cassell & Co., Ltd. 1894.

THIS is a book which should prove useful to the sick nurse, part of whose duty is to attend to the preparation of suitable dishes for her patients. The introductory chapters, on "Food and Digestion," and on the various kinds of diet, will help her intelligibly to follow the practical instructions as to choice of food, as also to cooking.

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

MEDICINE.

By T. K. MONRO, M.A., M.D.

Latent Tuberculosis of the Tonsils.—M. Dieulafoy recently made two very important communications on this subject to the Academy of Medicine in Paris. Besides the two classical forms of pharyngeal tuberculosis, the one acute and very painful, with granulations, and the other chronic and ulcerative, and scarcely affecting the glands, this observer describes a third form, taking the form of adenoid tumours with hypertrophy of the tonsils. To demonstrate it, he made 96 inoculations—61 times with pieces of tonsil, and 35 times with adenoid vegetations removed by different laryngologists or surgeons. Guinea-pigs inoculated with tonsil died of tuberculosis in 13 per cent of cases; those inoculated with adenoid tissue died in the same manner in 20 per cent of cases. This latent tuberculosis is often due to milk or other food from tuberculous animals. The tubercular bacillus, which, as Straus has shewn, may be present in the nasal fossæ of healthy subjects, can find, in children predisposed to lymphatic-tissue hypertrophy, an excellent culture-medium in the tonsil. This tissue struggles, as it were, to become fibroid as the natural mode of cure. But too often the glands become affected, and the morbid process may extend further under the depressing influences of intercurrent diseases, such as small-pox, influenza, and especially syphilis. The organism gradually reaches the nervous system and the lungs by way of the right heart. If tuberculosis attains this stage, it may of course become still more widely disseminated.

M. Chauveau, commenting on M. Dieulafoy's paper, recalled his experiments on the action of tuberculous foods. Infection by the mouth is common, as the swelling of the submaxillary glands testifies. In cattle which have no tonsils, the portal of entrance is the adenoid tissue at the base of the tongue. In the pig, infection by the tonsils, even without obvious lesion of the epithelium, is frequent. In the calf, buccal infection produces a rapid general tuberculosis such as is not produced even by subcutaneous inoculation.

Dieulafoy returned to this subject a week later, to deal more particularly with its therapeutics. The most rigorous precautions must be taken to safeguard children who are hereditarily predisposed to tuberculosis, and who belong to families some of whose members are already suffering. Children of this kind ought to be removed from such hot-beds of infection, and if this is impossible, the sick friends must be instructed to spit only into special vessels containing some antiseptic solution, so as to avoid desiccation of the sputa and scattering of the bacilli in dust. Bacilli which enter the nasal fossæ of resistent persons remain innocuous, but in predisposed subjects these organisms may rapidly bring about fatal results. Contagion may occur, not only through the milk of cows with mammary tuberculosis, but also through eating undercooked meats, even though salted and smoked, or cheese made from infected milk, though these modes are not so common. Food given to any child that is in danger of tuberculosis, either by contagion or by heredity, ought to be thoroughly cooked. Milk should be sterilized. If, in spite of these precautions, infection of the tonsil should occur, good feeding becomes all the more indispensable, and in particular with fatty substances. Codliver oil should be given by the glass and not by the spoonful. Tunny, sardines in oil, pâté de foie gras, butter, and caviare may be included in the dietary. The child should live at the seashore, and the stay there ought to be very

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prolonged. Of the children suffering from cervical adenopathy who live for fifteen months at Berck, 76 per cent come back cured. With a residence of only three months, the figures fall to 41 per cent. From the surgical point of view, ignipuncture or electropuncture is preferable to ablation, as the latter might open a gate of entrance for the bacillus.—(*Progrès Médical*, 4th and 11th May, 1895.)

The Possibility of Fallacy in the Results of Fehling's Test for Sugar in the Urine in the case of Patients who are taking Sulphonal.—Lafon relates the case of a patient who, in 1891, was excreting 183 grammes of sugar in the twenty-four hours. Glycosuria ceased after some months' treatment. This patient took medicinal doses of sulphonal during two months, the daily amount being three-quarters to one gramme. Frequent analyses of the urine were made, and after the administration of sulphonal began, it was always possible, by boiling for a short time, to obtain a well-marked precipitate of a yellow colour—namely, oxide of copper, which, in the absence of proper precautions, would have led to the erroneous conclusion that sugar was present. The same samples of urine, examined by the polari-saccharimeter with monochromatic light (yellow sodium flame), failed to give the deviation to the right which is characteristic of diabetic sugar, and indeed gave the slightest appreciable deviation to the left. Twenty examinations yielded the same result—viz., the presence of sugar indicated by Fehling's test, but excluded by the polariscope.

The reduction of Fehling's solution is not due, as a rule, to a product of transformation of sulphonal in the animal economy, for the addition of a medicinal dose of sulphonal (1 gramme per litre) to urine absolutely free from sugar will produce exactly the same reduction.—(*La France Médicale*, 10th May, 1895.)

Peritonitis from Pneumococci.—Cases of this kind have been already reported. Kirmisson relates another which he operated on and cured. A child, the side of whose foot was suppurating, took ill six days after it came under observation with symptoms of peritonitis. The writer supposed this to be due to tubercle, and opened the abdomen. He found flakes of pus of a green colour, and viscid, gluey, and mixed with fibrin—different from ordinary tuberculous pus. The microscope showed the presence of pneumococci and some streptococci without tubercular bacilli.—(*Gaz. Méd. de Paris*, 11th May, 1895.)

Abscess of the Liver in Children.—Tschernoff has published three cases of suppurative hepatitis in children. If this affection has been well studied in adults, comparatively little has been written about it as it is met with in children, doubtless owing to the infrequency with which it occurs at an early age.

Hepatic abscesses in the child and in the adult have many features in common. The disease may be absolutely latent and insidious. Adults with hepatic abscess may be able to perform any kind of work, and the author has seen cases in children where the disease entirely escaped recognition, or was mistaken for some other affection. Thus, in one instance the diagnosis was only made when peritonitis consecutive to opening of the abscess set in. In another case, ordinary tuberculosis was the diagnosis until the child died suddenly; no little astonishment was caused when an abscess of the liver was discovered. In Tschernoff's third case, the patient was supposed to be suffering from typhoid fever; only the autopsy revealed the true cause of the fever and other general symptoms.

The diagnosis, then, may be very difficult. The exaggerated convexity of the right hypochondrium, the dilatation of the base of the thorax at the right side, and the accompanying œdema of the hepatic region ought to be borne in mind. These signs may suffice for the diagnosis if they are associated with the febrile phenomena that occur during the development of all purulent

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foci. A special characteristic, however, of hepatic abscess, and particularly in the case of children, is that there may be, though only in rare instances, no local pain. Too much importance, therefore, must not be attributed to the absence of pain.

When the abscess has attained a certain size, the increased convexity of the dome of the diaphragm on the right side, and the diminished amplitude of the movements of the liver during respiration may become apparent, but these and other symptoms may be modified by the complication of a right pleurisy.

It will thus be seen that in a child, even more than in an adult, an abscess of the liver may escape notice. Care must be taken especially not to mistake it for a pleurisy, and the observer must not hesitate, if the diagnosis is doubtful, to examine the pus bacteriologically. The pus of hepatic abscess is microbic, but sterile.—(*Gaz. Méd. de Paris*, 11th May, 1895.)

Mortality from Tuberculosis among Hospital Staffs.—Marfan, as well as other writers, has called attention to the risk run by those who are employed in hospitals (in Paris) of taking tuberculosis in some form. He says it decimates the lay attendants. At the Hôpital Necker, half the attendants take phthisis. Those who attend to their duties with the greatest zeal and devotion are most likely to be affected. It is chiefly those who work in the medical wards who suffer; attendants in the surgical department are usually spared.

Debove and Landouzy have also pointed out this danger; the hospitals of Paris constitute a permanent source of danger, not only to the patients admitted, but to their own employees.

The remedy is, of course, isolation of tuberculous patients, and protection in this way of the non-tuberculous. It is singular, but true, that this also protects the hospital staff, no doubt through the hygienic precautions taken, and the careful attention to disinfection. Thus, Doischevallier adduces the case of a sanatorium which accommodates about a hundred patients and sixty servants. In a period of fourteen years, only one of the numerous maids in attendance upon the invalids, or coming in contact with their linen or other property, became affected. It was then ascertained that her father and mother had died of phthisis. Fortunately this patient, cared for at the beginning, was cured.

Doischevallier cites as still more striking the results obtained in the Brompton Hospital, where fifteen thousand cases of phthisis were treated in twenty years. No doctor, chaplain, superintendent, or other official, male or female, became affected with pulmonary disease.

The accommodation provided in the Parisian hospitals for humbler members of the staff is unsatisfactory, and it is calculated to manufacture patients for the wards.—(*Progrès Médical*, 30th March, 1895.)

Antistreptococcic Serum in Puerperal Septicæmia.—Jacquot mentions the case of a woman with puerperal septicæmia, in whom a single injection of thirty cubic centimetres of Charrin & Roger's antistreptococcic serum was succeeded by a fall of temperature, on the day of injection, from 40·8° to 37° C (105·4° to 98·5° F). The patient seemed to be quite cured after three injections. The fever, however, soon returned—in consequence, it was supposed, of the patient being infected by her mother who had erysipelas of the face. The injection was therefore renewed; the temperature again fell to the normal, and the patient was definitely cured.—(*Gaz. Méd. de Paris*, 18th May, 1895.)

Phlegmon of the Posterior Mediastinum.—A young woman began to suffer, five days after her œsophagus had been catheterised, from severe pain. The neck was swollen, the breath fœtid, and the general condition alarming. An incison was made along the sternomastoid muscle, as in œsophagotomy, and fœtid pus issued in large quantity from in front of the vertebral column. A bone which had perforated the œsophagus was

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detected and extracted by the finger. The entire posterior mediastinum was filled with pus.

A drainage tube introduced in the ordinary way acted badly. The patient was therefore put in the Trendelenburg position, but though the evacuation proceeded satisfactorily, the patient could not long endure the position of her head, and the siphon was therefore resorted to. Improvement thereupon proceeded rapidly. The patient grew stout; her appetite was excellent, and soon only a small fistula remained at the root of the neck. The patient then insisted on leaving hospital. She remained quite well for more than a month, after which fever, shivering, &c., returned. Ziembicki of Lemberg, who reports the case, wished to open the posterior mediastinum, but the patient declined the operation, and in course of time succumbed. The autopsy revealed a large purulent focus in front of the vertebral column, a purulent pleurisy on the right side, and gangrene of the lungs. These septic accidents would not have occurred if the writer had dared to drain the posterior mediastinum through and through. The existence of the fistula, and the persistence of the focus of infective mediastinitis, exposed the patient day by day to the risk of septic processes which ultimately destroyed life.—(*La France Médicale*, 15th March, 1895.)

DISEASES OF THE SKIN.

By Dr. A. NAPIER.

The Question of the Contagiousness of Molluscum Contagiosum.—Dr. Henry W. Stelwagon discusses this subject in the *Journal of Cutaneous and Genito-Urinary Diseases* for February last, marshalling his evidence—which is drawn almost entirely from medical literature—under four heads:—

1. Clinical examples of communicability from one to several members of a household, and from family to family.
2. Clinical examples of its spread in asylums, schools, hospitals, &c.
3. Examples of accidental inoculation.
4. Successful experimental inoculation.

Negative evidence, such as the occurrence of the disease in isolated cases, and the failure in most instances of the attempt to produce the disease by inoculation, has, in Dr. Stelwagon's opinion, no weight whatever, one positive result counter-balancing any number of negative results. Dr. Stelwagon concludes his very exhaustive paper as follows:—"This constitutes the greater part of the affirmative evidence which has been accumulating for some years, and which, as stated in the preliminary part of this paper, can lead to but one conclusion—the contagiousness of the disease. The clinical evidence alone is indeed overwhelming, and, unless we are to place an interpretation upon the clinical facts of this disease different from that which we are accustomed to place upon those of other contagious skin diseases, is in itself convincing. Supporting and confirming the clinical side of the question, however, is the success in the cited examples of experimental inoculation, and also the several instances of accidental inoculation referred to. In a careful or even superficial survey of the subject one point presents itself at times boldly—that is, the variable and often long period of incubation. This is for obvious reasons more conspicuously shown in the cases of experimental inoculation, but the same is recognised in a study of the ordinary clinical cases. It is probable that the difficulty in tracing the source of contagion in some instances is due to this very fact; and this also complicates the investigation of the disease by experimental inoculation. As yet, from the material at hand, the proper method of artificial inoculation cannot be definitely stated; there was, in fact, little or no uniformity in the methods employed in the successful instances recorded. Indeed, until we know the character of the parasite, its mode of

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entrance, its life habits, &c., very little progress in this direction is to be expected. Of the various parasites alleged to be the cause of the disease, the psorosperm is or was the most promising, but the elaborate investigations by Török and Tommasoli, and also those by Piffard and others, would seem to throw great doubt upon this point. That the disease is parasitic, and that the parasite will be sooner or later recognised, however, no one can question."

Antitoxin Rash.—Dr. D. Walsh read a note at a meeting of the Dermatological Society of Great Britain and Ireland (recorded in the *British Journal of Dermatology* for February, 1895) on the transitory rash often produced by the hypodermic injection of antitoxin. He mentions its occurrence in 25 out of 80 cases, in which the rash appeared from 7 to 19 days after the first injection, and was attended by some itching. In a summary of 231 cases treated by antitoxin, published by Dr. Moisard, of Paris, it is noted that "cutaneous manifestations, sometimes accompanied by pain in the joints, simulating articular rheumatism, were observed in numerous instances. Among these, fourteen cases of urticaria, nine of scarlatiniform erythema, nine of polymorphic erythema, and one of purpura, were noted." Recalling to mind a somewhat similar dermatitis following the use of tuberculin, which Dr. Walsh attributed to an attempted excretion of the tuberculin by the skin, some such theory is here broached as accounting for the antitoxin rash. "This theory of excretory irritation, as it may be called, appears to be supported by a number of physiological and pathological data. The skin function is to a great extent analogous with that of the kidney. Indeed, the sweat has somewhere been aptly described as a kind of diluted urine. A little enquiry will show that many substances of a chemical or organic nature, when introduced into the blood, may irritate in turn one or all of the channels of exit from the body, as, for instance, bowel, kidney or skin. If we take the poison of gout, presumably uric acid, we find that it may attack any excretory outlet, and that it is associated with various kinds of dermatitis, with pharyngitis, with bronchitis, with affections of the alimentary canal, and with nephritis. My suggestion is that these disorders are all of them different expressions of excretory irritation, acute or chronic. Again, the poison of scarlet fever irritates all excretory channels, skin, kidneys, and mucous membranes. Dealing with that disease, Dr. Howship Dickinson has insisted that when skin elimination is hindered by the use of inunctions there is an increased tendency to nephritis. Many drugs that cause skin eruptions are found to irritate other excretory outlets. Iodine and bromine, when introduced into the system, are usually eliminated by the kidneys. Should iodine, however, be thrown off by vicarious channels, it gives rise to the group of symptoms known as "iodism," characterised by coryza, gastro-intestinal troubles, and various forms of dermatitis. Moreover, in pustular forms of dermatitis due to bromine and iodine, both minerals have been found in the discharges by Adamkiewicz and Guttmann, as mentioned by Dr. Pye-Smith.

"It should be noted that the antitoxin treatment is often associated with kidney trouble, so that the drug has evidently an irritant action on one great excreting organ. *Primâ facie*, it does not seem altogether improbable that the rash on the skin may be due to the vicarious irritation of another outlet.

"The theory of excretory irritation would explain other clinical facts, such as the fugitive rashes noted in tuberculin treatment, in chronic constipation, in surgical scarlatina, in diphtheria itself, and in some ptomaine poisonings."

At the same meeting of the same Society, Dr. Pye-Smith read a short paper on the same subject. He states, "It is not the immediate effect of the puncture, for it appears in distant parts. It takes the form of a roseola, with well-defined margins, a bright pink colour, and no papules, vesicles, or pustules. After twenty-four hours it begins to fade, and seldom lasts three days. There is little irritation and little smarting, and desquamation is either absent or extremely slight. Its seat appears to be the limbs rather than the trunk or face.

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"This eruption is of interest, first, because it is manifestly allied to the occasional erythematous rash of rheumatism, and to the exanthems of measles and scarlatina; and thus additional evidence is afforded that these also are due to the circulation of chemical poisons.

"Secondly, the eruption is still more closely allied to the rose-rashes produced by eating mussels and some other articles of food. The animal poison which produces erythema and urticaria in one of these cases has been described under the title "Mytiline," as a ptomaine, an alkaline product, and probably one of the group of amines. With this again we may connect the eruption of copaiba, and those caused by belladonna, quinine, and many other drugs.

"But these secondary toxic and medicinal eruptions agree with erythema, in the restricted sense of the word, in the character and form of the rash, in its short course, and its localisation.

"If this view be correct, we have now another reason for including erythema and urticaria with some medicinal and toxic eruptions, and some exanthems, in a natural group, and for excluding therefrom all chronic eruptions and all forms of superficial inflammation of the skin, or slight degrees of eczema, which find their natural position with dermatitis produced by local irritants, and not due to internal causes."

Parasites in Paget's Disease of the Nipple. Prof. G. Banti, Florence (*Lo Sperimentale*, March, 1894).—The breast, which was removed together with the neighbouring axillary glands, was the seat of Paget's disease of the nipple. Professor Banti examined several pieces, previously hardened in corrosive sublimate (5 per cent), Fleming's solution (osmic acid 1 per cent) 80 c.c., chromic acid (10 per cent) 15 c.c., glacial acetic acid 10 c.c., distilled water 95 c.c., and finally in alcohol.

The tumour presented in the main the characters of carcinoma as seen in this region; in several of the "cancer-cells" bodies resembling those described by Soudakewitch, Ruffer, Walker, and others, as parasites (?) of carcinoma, were readily detected. Professor Banti states that after having tried several methods, the best results were obtained by staining the sections with carmine and hæmatoxylin; picric acid or orange may be employed as a third stain without interfering with the effect of the other two. The nuclei stain well with carmine, and the parasites assume a typical violet tint with logwood.

The parasites vary from 2μ to 15μ in size: (i.) some show a violet halo, within which is a small violet structure, provisionally termed a nucleus by Professor Banti; (ii.) others show in their periphery delicate lines, radiating centripetally towards a clear, colourless area, in which the violet-stained structure lies (nucleus of the parasite); (iii.) others, again, show the chromatic substance massed in the centre in which the well-stained nucleus lies. Lastly (iv.) others give evidence of a distinct capsule.

Professor Banti regards these bodies as parasitic intracellular organisms, and affirms that in spite of similar behaviour to various stains, they differ *in toto* from the intracellular "inclusions" which occur in cells of carcinoma. His paper is illustrated by several figures, which show clearly the parasites in various stages of multiplication, within the cells of the neoplasm. The drawings show elongation of the protoplasm, rod-like disposition of the nucleus swollen at either end, dumb-bell shape of the parasite, and finally complete division into two. Some of the epithelial cells show even four parasites. Their reproduction is thus one of gemmation, and resembles that of saccharomyces.

Professor Banti thinks that this is not the only method of reproduction. Some of the parasites are enclosed in a capsule which takes the carmine stain; the chromatic substance is massed centrally, showing a copper-violet colour. The nucleus, more deeply stained, shows a very small round body (nucleolus) easily recognized. Within the capsule, in the substance of the parasite, diminutive bodies, resembling capsuled cocci of a deep violet colour, and surrounded by a delicate colourless areola, are easily recognized. In

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some specimens the protoplasm of the epithelial cells shows similar stained bodies, which stand out in marked contrast to the carmine tint. Professor Banti considers these little cocci-like bodies to be produced endogenously within the parasite, and capable of bursting through its capsule into the cell protoplasm, where they acquire chromatic substance and thus develop into typical parasites. He bases this view on the cystic character of some of the parasites, from which these little bodies would appear to have migrated. Such cystic structures are irregular in outline, and either show granular detritus faintly violet, or are colourless.

As regards the relation of Paget's disease to carcinoma, he dissents from the views of Wickham and others, and maintains that the mammary tumours, in his case at least, originated solely from the glandular epithelium, and that the bodies described as psorosperms are ordinary cellular inclusions, and having nothing in common with parasites above described. Even the bodies Professor Banti has described with such detail are rather viewed in the light of secondary importance; for he especially lays stress upon the fact that these bodies were most numerous in the older parts of the neoplasm. In short, the whole question of parasites in carcinoma is still unsettled, and what evidence there is rather tends to assign a secondary pathological importance to the parasites he has figured. Professor Banti does not admit the doctrine of psorospermosis as applied to carcinoma.—(*British Journal of Dermatology*, March, 1895.)

Two Cases of Xeroderma Pigmentosum. Prof. Tommaso de Amicis (*Giorn. ital. delle mal. vener. e della pelle*, fasc. III., Sept., 1894).—Both these occurred in the same family. The patients were aged 6 years and 4 years respectively. There was nothing important in the family history. The first signs appeared in both cases during the first year of life. The disease was typical, and implicated the face, lower third of forearms, and the backs of the hands. The skin was harsh, dry and branny, with pigment spots thickly disposed, and slight scattered telangeiectases. Two years later there were distinct neoplasms on the face, the pigment spots and telangeiectases had become more marked. There were depressed scars: ectropion and eversion of the alæ nasi were present. The corneæ showed distinct nebulæ. In the elder child there was distinct swelling of the lower epiphyses of the forearms. The microscope revealed the following changes:—The epidermis was sprouting into the subjacent derma, which was greatly injected. There were no epithelial nests, but numerous cells were vacuolated. The derma showed a myxomatous structure, and numerous pigment granules were seen extending into the deeper strata of the epidermis.

Micro-organisms could neither be detected in the tissues nor in the blood, which showed numerous eosinophile cells. Prof. de Amicis discusses at length the terminology of the disease, and suggests the addition of *epitheliomatosum*.

The peculiar points about these two cases are:—

1. The affection developing in infancy and occurring in the same family.
2. The epiphyseal thickening and the presence of molluscum in the face of the elder child.
3. The benign character of the neoplasms, for where these were removed no recurrence occurred.
4. The gradual deterioration of the general health, which could not wholly be referred to the disease.
5. The negative results of bacteriological examination and the presence of numerous eosinophile cells in the blood.

He concludes that Kaposi's disease—*i.e.*, Xeroderma pigmentosum— is not a lesion produced by external irritants (cold or sun's rays) or by any known micro-organism, but that it is a special dystrophy of the skin of unknown pathogenesis.—(*British Journal of Dermatology*, February, 1895.)

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DISEASES OF THE EAR.

BY DR. WALKER DOWNIE.

Exfoliation of Cochlea. By M. A. Goldston.—Dr. Goldston showed this case before the St. Louis Medical Society. The patient was a coloured boy, 6 years of age, suffering from necrosis of the internal ear. The "cochlea and deep structures of the petrosa," which he found to be necrosed, he removed, and he reports that throughout the entire course of treatment following operation there was neither pain, vertigo, tumitis, nor nausea present. An hour after operation the patient was up and walking home with equilibrium unaffected, and with some hearing power remaining on affected side.—(*St. Louis Medical and Surgical Journal*, March, 1895.)

This same case is reported in full in the June number of the *Journal of Laryngology*, just to hand, with the addition of *post-mortem* notes. Acute miliary tuberculosis seemed to result secondary to the aural disease, and the patient, whose case was described and demonstrated before the St. Louis Medical Society on 15th January, died on the 29th of the same month. The examination of the affected temporal bone corroborated the statements made regarding the character of the necrosed and exfoliated areas. All landmarks of the osseous external meatus and tympanic cavity had disappeared, but the superior wall and part of the posterior portion of the internal auditory meatus remained intact. There was no evidence of any meningeal lesion, tubercular or otherwise.

A Contribution to the Knowledge of Otitic Abscess of the Brain.—In the *Wiener Med. Presse*, No. 49, 1894, Dr. J. Pollok reports the case of a patient, 14 years of age, who had suffered from right-sided otorrhœa, following measles, for two years. The right mastoid had been opened to evacuate pus, but fever and headache persisted, and on the third week following operation there was frequent vomiting, unconsciousness, paralysis of the left arm and leg, Cheyne-Stokes breathing, dilated and inactive pupils, slight ptosis of the right eyelid, and temperature 38° C. Neither choked disc nor neuro-retinitis. An abscess in the right tempero-sphenoidal lobe was diagnosed and operation advised. During the night before the proposed operation the patient's condition suddenly improved, breathing became normal, consciousness returned, headache disappeared, pupils became active and reacted well, ptosis disappeared, and there were some spontaneous movements of the left extremities. On examination, the dressings were found to be saturated with fœtid pus, and in the mastoid wound there were protruding granulations. On the tegmen antri was a defect nearly the size of a farthing, out of which greenish-yellow stinking pus with necrosed tissue escaped. The abscess had evidently burst through the tegmen. The cavity was washed out with 1 in 2,000 sublimate solution, and healing was complete in six weeks.

On the Diagnostic Value of the Tuning-Fork as evidenced in a Case of Tumour of the Base of the Cranium.—To illustrate the diagnostic value of the tuning-fork, Schwabach reports the case of a female patient, aged 36, who was admitted to hospital complaining of persistent headache, and who, on examination, was found to have a rapidly increasing paralysis of the third and fourth nerves of the left side, as shown by paralysis of the ocular muscles supplied. As time passed, sight became affected, sensibility over the skin supplied by the fifth nerve became diminished, and later, total paralysis of the ocular muscles of both sides followed by complete blindness, protrusion of both eyeballs, and prominence of the right temporal region. In the right middle meatus of the nose, tumour-like masses were found which proved to be malignant. During her residence in hospital, noises in the left ear accompanied by deafness appeared. A tumour of the

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base of the cranium was diagnosed which was exerting pressure on the first six cranial nerves. The aural disturbance was at first supposed to be due to pressure on the auditory nerve, but the tuning-fork gave evidence against this, as there was marked diminution of hearing for deep tones by air-conduction, while there there was increased length of perception for the same tones by bone-conduction: Rinne's test, negative; Weber's, positive. This pointed conclusively to disturbance of the conducting apparatus, and not of the nerve. At the *post-mortem* examination, the internal ear and auditory nerve were found to be free from any pathological change, while the middle-ear was nearly filled with the tumour-mass.—(*Berlin. Klin Wochenschrifte*, No. 43, 1894.)

Pilocarpin in Diseases of the Middle Ear and Labyrinth.—Dr. Schirmunsky (St. Petersburg) here describes his experience of pilocarpin in the treatment of affections of the ear. In two cases of dry middle-ear catarrh he gave subcutaneous injections of pilocarpin, but no improvement followed in either case. In twenty-five cases, injections of pilocarpin were made direct into the tympanum, but with no better results than follow the injection of alkaline solutions. Subcutaneous injections were also employed in some cases of labyrinthina disease secondary to tympanic mischief, but in no case did any beneficial effect follow. In two cases of recent implication of the labyrinth, one of traumatic effusion into, and the other a syphilitic affection of, the labyrinth, distinct improvement was obtained; and the conclusions he draws from his experience are very similar to the opinions expressed by the great majority of unbiassed practical otologists, namely, that it is only in very recent affections of the labyrinth, whether syphilitic, traumatic, or secondary to tympanic inflammation, that any good can result from hypodermic injections of pilocarpin, and the earlier treatment is begun, the more hopeful the issue; and secondly, that pilocarpin is useless in old-standing affections of the labyrinth and in chronic dry catarrh of the tympanum.—(*Monat. für Ohrenheilk.*, February, 1895.)

Books, Pamphlets, &c., Received.

Early Scoliosis, or Curable Curvatures of the Spine, by Percy G. Lewis, M.D. London: John Bale & Sons. 1895. (2s. 6d.)

Catechism Series. Surgery, Part I. Edinburgh: E. & S. Livingstone. (1s. net.)

Catechism Series. Materia Medica, Part VI. Edinburgh: E. & S. Livingstone. (1s. net.)

The Conditions of Radical Cure in Cancer, &c.; Reprinted Papers, by Herbert Snow, M.D. London · J. & A. Churchill. 1895. (2s. 6d.)

Leprosy, in its Clinical and Pathological Aspects, by G. Armauer Hansen and Carl Looft; translated by Norman Walker, M.D. Bristol: John Wright & Co. 1895. (10s. 6d. net.)

Formulaire des Specialités Pharmaceutiques, par le Dr. M. Gautier et F. Renault. Paris: J. B. Baillière et Fils. 1895.

Mentally-Deficient Children; their Treatment and Training. By C. S. Shuttleworth, B.A., M.D. London: H. K. Lewis. 1895. (4s.)

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Hygiene and Public Health, by Louis C. Parkes, M.D. Fourth Edition. London: H. K. Lewis. 1895. (10s. 6d.)

Text-Book of Forensic Medicine and Toxicology, by Arthur P. Luff. M.D., B.Sc. Lond. In Two Volumes. London: Longmans, Green & Co. 1895. (24s.)

Annual Report of the Department of Health of the City of Chicago for the year ended 31st December, 1894, by Arthur R. Reynolds, M.D. Chicago. 1895.

Text-Book of Operative Surgery, by Dr. Theodor Kocher; translated by Harold J. Stiles, M.B. London: A. & C. Black. 1895. (20s.)

The Value of Electrical Treatment, by Julius Althaus, M.D. London: Longmans & Co. 1895. (2s.)

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THE

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ORIGINAL ARTICLES.

NECROSIS OF THE LABYRINTH,[1]

WITH REPORT OF A CASE.

BY JAMES GALBRAITH CONNAL, M.B., C.M.,
Assistant Surgeon, Glasgow Ear Hospital.

CARIES and necrosis of parts of the temporal bone are not unfrequent in neglected suppurative disease of the ear, and more especially in cachectic subjects, or after the specific fevers; but the mischief is more frequently confined to the mastoid, and it is comparatively rare to find the petrous portion of the bone involved. This result is due to the anatomical peculiarities of the different constituent parts of the temporal bone, the pyogenic microbes finding easier access to the loose, spongy bone of the mastoid than through the ivory denseness of the petrosa. It is possibly for the same reason, and also that at that period of life, the different parts of the bone are held together by fibrous tissue, that the disease is more frequent in children than in adults. From its anatomical relationship the cochlea is the part of the petrous portion of the bone most liable to be affected by disease. Professor Macewen[2] places the relative frequency with which

[1] Paper read and specimen shown at a meeting of the Glasgow Pathological and Clinical Society on 13th May, 1895.

[2] *Pyogenic Diseases of the Brain and Spinal Cord*, p. 64.

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different parts of the temporal bone are attacked by caries and necrosis as follows:—(1) The mastoid; (2) the roof of the tympanum and the antrum; (3) the sigmoid groove; (4) the posterior wall of the external auditory canal; (5) the tympanic floor with the posterior wall of the carotid canal; (6) the petrous portion, including the structures constituting the inner ear.

The following is the history of a case where there was an exfoliation of a part of the cochlea, which was removed as a sequestrum from the external auditory canal of a patient suffering from otorrhœa:—

G. E., a young man, a packing-box maker, 29 years of age, presented himself complaining of unilateral deafness, severe pain and purulent discharge in the left ear, pain and swelling over the mastoid process, headache and slight giddiness—the urgent symptoms being of a fortnight's duration.

He said he had an attack of measles when 4 years old, and since then there had been deafness and a discharge of "matter" from the left ear. Two years ago he had "an acute inflammation" in this ear, with severe pain and swelling in the external auditory canal, pain over the left mastoid process and up the side of the head, and particularly severe from the mastoid process back in the neck to the middle line. There were sickness and vomiting, giddiness, with a temporary loss of consciousness. On three different occasions while going along the street he became giddy, "everything seemed to be going round him," and he fell forwards, always on his face, and lost consciousness. This loss of consciousness, however, seems to have been only momentary, for he could raise himself from the ground and proceed on his journey unaided. At this time he staggered very much when he walked, and it became so noticeable that his shopmates made remarks about it. He himself observed that if he stooped to the ground to lift anything, he had a great tendency to fall forwards, and had some difficulty in getting to the erect posture again. This went on for some time, but the pain became so severe that he had to cease work, and he was confined to bed for six weeks. He recovered from this attack, and, except for the deafness and the discharge from the ear, he experienced no inconvenience from it, but it was noticeable that the discharge from the ear was more profuse from this time.

About a fortnight before the date of his first coming under observation, as the result of standing in a draught, he "caught cold," and the acute symptoms set in for which he presented himself for treatment.

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Examination showed a swelling, painful to touch, over the left mastoid process. The external auditory canal on the left side was much swollen, very tender, and at the tympanic end was blocked up with granulation tissue. The discharge in the canal was very offensive. Temperature (in the mouth) 101° F.; pulse 120, regular. Pupils large, but equally dilated and rather sluggish in reaction. Tongue foul, and breath very offensive. Was absolutely deaf in the left ear, not hearing the tick of a watch even on pressure against the ear. The sound from a tuning-fork applied to the vertex was referred to the right ear. There was no facial paralysis; no tinnitus, and, during this last illness, only one or two slight attacks of giddiness, but not at all marked in the same way as on the previous occasion. No inco-ordination of movement. The other ear—the right—was normal.

The external auditory canal was syringed out with warm boracic solution, and the granulation tissue was removed with the polypus snare. Afterwards, on syringing, there came away the part of the cochlea shown as a specimen to-night. In a short time all the urgent symptoms had subsided, so that it was difficult to get him to pay any attention to his ear.

The specimen consists of one turn and a half of the cochlea, comprising the apex coil and a part of the central coil. The lamina spiralis ossea is well marked, dividing the lateral border into the scala vestibuli and the scala tympani. What is also well brought out in the specimen is the width of the scala tympani in the central coil, but narrowing as it approaches the apex, and the consequent enlargement in the apical coil of the scala vestibuli as the lamina spiralis ossea approaches the floor to end in the hamulus.

About three months after the sequestrum was removed, the hearing power was again tested in various ways—with the watch, with the tuning-fork, with Galton's whistle, with the ear trumpet, and with the voice.

The watch, which should be heard at 36 inches, could not be heard even on pressure against the ear. He could not hear the tuning-fork held opposite the left ear, but when the watch and the tuning-fork were applied to the forehead, he referred the sound to the right ear (the healthy ear).

On applying Gruber's method for testing the hearing power —that is, if the sound from the tuning-fork cannot be heard, put the finger firmly into the external auditory canal and place the tuning-fork on this finger. On doing so the patient said he heard the sound, but only very faintly.

While testing him with Galton's whistle and with the voice,

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it was found impossible to exclude the hearing from the healthy ear. The right ear, which is normal, was plugged with damp cotton wool and a pad placed over it, but still he heard spoken words and the Galton's whistle held opposite the ear from which the part of the cochlea had been removed.

There was rather a significant result on testing him with the ear trumpet. When the ear-piece was inserted into the canal, and words spoken into the receiver in a conversational tone of voice, he said he heard the sound, but could not distinguish the words. On removing the ear-piece and speaking to him in the same tone of voice, he had no difficulty in distinguishing what was said to him.

When last seen all the urgent symptoms had disappeared. There was no swelling or pain; not even tenderness on pressure over the mastoid. The canal of the ear was still a little narrowed, and on the floor there was a slight localised prominence as if from an exostosis. The discharge was perfectly sweet, had almost entirely ceased, amounting to only a slight moisture in the canal.

There are some remarkable cases recorded in which parts of the petrous portion of the temporal bone have been exfoliated.

Michael extracted from the left ear of a child, 3 years old, several sequestra, and among them the upper portion of the inner wall of the tympanum, containing the greater part of the fenestra ovalis and the part of the facial canal which runs over it.

So far as I can find, there are only two cases of bilateral exfoliation of the cochlea. Gruber[1] describes one case where, on the right side, the entire cochlea was exfoliated, and, on the left side, the cochlea and a part of the vestibule. The patient survived, and there was no paralysis of the facial nerves. Emanuel Max[2] (Vienna) records another case of bilateral exfoliation of the cochlea in a man, 23 years of age, who had suffered from a double otitis media dating back to childhood. Here the sequestrum from the right ear contained the entire cochlea, and from the left ear the lower turn of the cochlea. There was facial paralysis on both sides. The man developed meningitis and died.

Gruber[3] also mentions two cases in his own practice where, after extrusion of the cochlea, there was a certain measure of hearing retained; and he quotes a case of Stepanow's, of Moscow, where the upper section of the cochlea (viz., the

[1] *Text-Book Diseases of the Ear*, p. 418.
[2] *Archives of Otology*, vol. xxi, pp. 342-350.
[3] *Text-Book*, p. 420.

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upper coil and a half) was exfoliated, and not only did the patient hear with that ear, but, after careful testing with all tones within the perception of the human ear, from the lowest up to the highest, he showed no deficiency in the perception of tone. Indeed, Stepanow affirms that the hearing power for ordinary and whispered speech proved greater on the affected than on the sound side. The only anomalies that could be detected were a reversal of the result of Weber's experiment, and a shortening of the duration of the sound of a tuning-fork on bone-conduction. Stepanow formulated the following conclusions:—(1) The destruction of the upper part of the cochlea does not involve the loss of perception of lower tones in man; (2) this fact is sufficient to disprove Helmholtz's hypothesis, since there is no positive proof for it; (3) the loss of the upper part of the cochlea does not produce tone defects; (4) it has no influence—at least no qualitative influence—upon the perception of ordinary or whispered conversation; (5) from the preceding deductions it does not follow that the cochlea has nothing at all to do with the perception of sound, the same as it does not follow that the semi-circular canals and ampullæ have nothing to do with the perception of sound, because hearing may be preserved when there is congenital malformation or necrosis of these parts, or after they have been cut experimentally; (6) we lack, as yet, a basis on which to assign the perception of different kinds of sounds (tones, noises, and speech) to different parts of the labyrinth."[1]

Gruber and other authorities, on the evidence of these and other cases, strongly maintain that partial disease of the labyrinth, and even of the structures which we look upon as sound-perceiving, does not necessarily imply total deafness. Politzer,[2] however, is of opinion that, in cases where perception for speech and musical tones is said to have been present after extrusion of the cochlea, this conclusion is erroneous, and he argues that the hearing by the other ear (in some cases presumably normal) cannot be excluded. In this contention Politzer is supported by Bezold[3] and Hartmann. Indeed, the latter,[4] discussing Stepanow's case, suggested the idea of simulation. In this connection, Dennert made an interesting experiment. He had a patient from whom the entire labyrinth had been removed. He filled up the canal of the healthy ear

[1] *Monatsschrift für Ohrenheilkunde*, April, 1886, p. 116.
[2] *Diseases of the Ear*, p. 456.
[3] *Archives of Otology*, vol. xvi, pp. 325, 326.
[4] *Ibid.*, vol. xvi, p. 255.

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with plugs of damp cotton wool, covered up the auricle in the same way, and then bound a moist towel over the ear. On testing the hearing of the ear from which the entire labyrinth had been removed, it was found that there was a fair measure of hearing retained, showing that it is impossible, in testing deficiencies of hearing in one ear, to exclude the hearing from the healthy ear. If further proof was needed, we have it in the fact that, in the only two cases on record in which there was a bilateral loss of the cochlea (viz., Gruber's and Max's), both patients were absolutely deaf. In Max's case, after the removal of the cochlea, the hearing was tested. There was a total deafness for speech and noises, the tuning-forks, C^2, C^3, C^4, being perceived neither by aërial nor by bone-conduction, C^1 and C being felt, but not heard.

So far, I have drawn attention only to cases in which a *part* of the petrous portion of the temporal bone has been exfoliated, but there are some instances mentioned in which the entire labyrinth has been removed. Wilde[1] mentions a case which I quote:—"I am indebted to Sir Philip Crampton for an examination of one of the most extraordinary pathological dissections of diseased bone perhaps in existence, consisting of the entire internal ear, cochlea, vestibule, and semicircular canals, with a small portion of the internal wall of the tympanum, which he drew from the meatus of a young lady who had the most urgent symptoms of inflammation of the brain, with paralysis of face, arm, and leg, and total deafness on one side—recovered from the bad symptoms—the paralysis of the extremities, after a copious discharge from the ear. This discharge, the facial paralysis, and deafness, continued for some time, accompanied by occasional attacks of pain in the ear, till one day Sir Philip perceived a portion of loose bone lying deep in the cavity of the meatus, and drew forth the specimen from which the accompanying illustration has been made. In this the hard external enamel of the bone does not appear to be affected, but the scala cochlea is more beautifully displayed than could possibly have been done by art."

Again, Toynbee[2] mentions that Mr. Shaw, in the Middlesex Hospital, on 31st July, 1855, removed from the external auditory canal a sequestrum of nearly the whole of the petrous portion of the temporal bone, 1 inch in length, and an average thickness of half an inch, showing on the one side the meatus auditorius internus, and on the other the internal

[1] *Aural Surgery* (1853), p. 376.
[2] *Diseases of the Ear*, p. 375.

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wall of the tympanic cavity, with the promontory, the fenestra ovalis, and the fenestra rotunda, the two latter openings broken and irregular, and through them were seen the interior of the vestibule with its fossæ, the cochlea, modiolus, and lamina spiralis. At the posterior part of the specimen, portions of the semicircular canals, broken off near their junction with the vestibule, stood up distinctly in view. This patient was a boy, 7 years of age, who had suffered from otorrhœa, affecting both ears, after an attack of scarlet fever two and a half years before. He had facial paralysis on the left side, and was completely deaf in both ears. Two months afterwards, except for the facial paralysis, the deafness, and a trifling discharge from both ears, he left the hospital in good health.

Quite as interesting as any of these cases is one which Dr. Barr[1] brought before this Society in November, 1886, and which is fully reported in the *Transactions* of the Society.[2] In Dr. Barr's case the entire osseous labyrinth—cochlea, vestibule, and semicircular canals—was removed as a sequestrum from the external auditory canal of a boy, 10 years of age, who had a purulent discharge from his right ear, dating from an attack of scarlet fever nine years before. When Dr. Barr first saw the boy, there was a polypoid growth in the ear. This was removed with the snare, and the sequestrum then extracted. Within two weeks of the removal of the sequestrum, the purulent discharge had entirely ceased. In this case there was facial paralysis on the right side, but, what is specially interesting is that, despite the loss of the semicircular canals on the one side, there was no giddiness or staggering. In this respect it resembled a case of Guye's,[3] where the semicircular canals, with a part of the vestibule, had been removed as sequestra, and there was an absence of all disturbance of co-ordination.

Another remarkable case, in which the whole labyrinth was involved, was reported by Dr. Turnbull, of Philadelphia, at the Fourth International Congress of Otology at Brussels in 1886, and which is fully reported in the *Transactions* of the Society, p. 106. Here the patient was a girl, 9 years of age, who had an otorrhœa on the *right side*, originating in an attack of malignant scarlet fever. The mastoid process became involved, and there was removed a sequestrum consisting of a great part of the mastoid cells on the right side. Four years afterwards the entire *left* labyrinth was exfoliated as

[1] *Lancet*, 29th January, 1887, p. 212.
[2] *Cf.* vol. iii, p. 16.
[3] Politzer's *Text-Book*, p. 456.

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TABLE OF CASES OF LABYRINTHINE NECROSIS SINCE 1886.

No.	Observer.	Sex and Age.	Cause.	Part of Temporal Bone Exfoliated.	Facial Paralysis.	Result.	Reference.
1	Stepanow (Moscow).	M. 23	Violence—blow on face.	Cochlea (upper coil and a half).	Facial paralysis.	Facial paralysis persistent.	*Monatsschrift für Ohrenheilkunde*, April, 1886, p. 116.
2	Hartmann (Berlin).	M. adult	Cold.	Two upper turns of cochlea.	Facial paralysis at beginning of illness.	Facial paralysis quite better.	*Archives of Otology*, vol. xvi, p. 252.
3	Gruber (Vienna).	M. 30	Severe cold.	Cochlea.	Facial paralysis.	Slight otorrhœa; facial paralysis diminished.	Text-book — *Diseases of the Ear*, p. 419.
4	Kretschmann (Halle).	M. 26	—	Cochlea.	Facial paralysis.	Very slight odourless discharge; facial paralysis gone.	*Arch. für Ohrenheilkunde*, vol. xxiii.
5	Kretschmann (Halle).	M. 48	—	Cochlea.	—	Suppuration ceased.	*Arch. für Ohrenheilkunde*, vol. xxiii.
6	Barr (Glasgow).	M. 11	Scarlet fever.	Entire osseous labyrinth (vestibule, semicircular canals, and cochlea).	Facial paralysis.	Facial paralysis persistent; discharge completely ceased.	*Lancet*, 29th January, 1887, p. 212.
7	Erskine (Glasgow).	F. 24	—	(1) Cochlea; (2) sequestrum of inner wall of tympanum, with fenestra ovalis and Fallopian canal; (3) small scale of bone from wall of cochlea; (4) long process of incus.	Facial paralysis.	Facial paralysis and otorrhœa persisting.	*Brit. Med. Jour.*, 1st September, 1888.
8	Turnbull (Philadelphia).	F. 9	(*a*) Malignant scarlet fever. (*b*) Diphtheria.	(*a*) *Right side.*—Part of mastoid. (*b*) *Left side.*—Whole labyrinth and Fallopian canal (cochlea, vestibule, and semicircular canals).	Left-sided facial paralysis.	Discharge entirely ceased in both ears; facial paralysis persistent.	*Transactions of the Fourth International Congress of Otology*, Brussels, 1888, p. 107.

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9	Weil (Stuttgart).	M. 4	Pertussis.	Greater part of cochlea, vestibule, outer lower semicircular canal, and portions of other two.	Facial paralysis.	Facial paralysis for six months; otorrhœa persisting.	*Archives of Otology*, vol. xx, pp. 79-80.
10	Theis (Berlin).	M. 26	Measles.	Cochlea.	Facial paralysis.	Cessation of suppuration, and complete recovery from facial paralysis.	*Arch. für Ohrenheilkunde*, bd. xxx, p. 185.
11	Theis (Berlin).	M. 56	No cause assigned.	(1) Cochlea (one and a half coils); (2) small unrecognisable piece of bone; (3) portion of outer auditory canal.	Facial paralysis.	Cessation of suppuration; facial paralysis persistent.	*Arch. für Ohrenheilkunde*, bd. xxx, p. 186.
12	Toeplitz (New York).	F. 6½	Scarlet fever.	Parts of the cochlea.	Facial paralysis.	Otorrhœa ceased; facial paralysis improving.	*Archives of Otology*, vol. xxi, p. 174.
13	Max (Vienna).	M. 23	Variola.	*Bilateral exfoliation:* (*a*) *Right side.*—Entire cochlea. (*b*) *Left side.*—Lower turn of cochlea.	Facial paralysis on both sides.	Death from meningitis.	*Archives of Otology*, vol. xxi, pp. 342-350.
14	Strazza (Genoa).	—	—	Cochlea.	—	—	*Il Sordamuto*, 1892, p. 91; *Archives of Otology*, vol. xxii, p. 446.
15	Ferreri (Rome).	Young child	—	Greater part of labyrinth (cochlea, vestibule, and part of the semicircular canals).	—	Suppuration ceased; healed very quickly.	*Archivio Italiano di Otologia*, vol. i, p. 203.
16	Ferreri (Rome).	F. 9	Measles.	Entire cochlea.	—	Suppuration ceased.	*Archivio Italiano di Otologia*, vol. i, pp. 203-204.
17	Connal.	M. 29	Measles.	Cochlea (apex coil and part of central coil).	None.	Slight odourless moisture in canal.	*Glasg. Med. Journ.*, vol. xliv, p. 161.

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a sequestrum through the external auditory canal. This occurred as a sequel to an attack of diphtheria, which, in addition to the necrosis of the left labyrinth, with facial paralysis, had resulted in loss of sight, hearing, and locomotion. The discharge ceased after the removal of the sequestrum; the paralysis of the legs and arms improved; and there was also a partial recovery of hearing in the right ear, but the facial paralysis persisted.

Among other cases mentioned, Voltolini extracted the whole labyrinth. Delstanche also extracted the complete osseous labyrinth, of which only one of the semicircular canals was awanting. In this country, Dr. Phillips,[1] Bolton, records a case similar to Dr. Barr's, and Dr. Pye,[2] London, removed the labyrinth as a sequestrum through an opening in the mastoid process.

Dr. Friedrich Bezold,[3] Munich, in a valuable paper, gives a list of all cases of labyrinthine necrosis which he found recorded up to 1886. He collected 46 cases (including 5 in his own practice). Allowing for 3 cases which he omitted, and other 2 known to him after the compilation of his paper (viz., one of Kirchner's and one of Roosa and Emerson's), this makes the number 51. To bring the statistics up to date, I have collected other 17 cases (including my own), making a total of 68 cases of labyrinthine necrosis. Of these, 10 cases, or about 15 per cent, died of consecutive brain or sinus affections. Bezold has recorded 9 deaths, and there is one in my list—a most interesting case reported by Emanuel Max, of Vienna—where there was bilateral exfoliation of the cochlea, with double facial paralysis. The man died of meningitis. The wonder is that more of these cases do not die of cerebral complications; but, as Dr. Barr points out in the paper before alluded to, the reason probably is that there is a localised thickening of the dura mater over the part, and this acts as a barrier against the inroads of the purulent process.

I have tabulated the 17 cases I have collected, giving, so far as the details are mentioned—(1) The sex; (2) the age; (3) the cause; (4) part of the temporal bone affected; (5) the presence or absence of facial paralysis; (6) the result; (7) the references. In one of the cases (No. XIV, Strazza, Genoa) I have been unable to give fuller details than mentioned, as the paper in which the case was originally reported is out of print. In addition to these 17 cases, Hartmann makes reference

[1] *British Medical Journal*, July, 1885.
[2] *British Medical Journal*, June, 1885.
[3] *Archives of Otology*, December, 1887.

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to a case that Kaufmann reports from Zaufal's Clinic, and Max Toeplitz, of New York, refers to a case of primary labyrinthine necrosis that Trautmann showed at a meeting of German Naturalists at Berlin.

The statistics bring out a curious point—viz., that the male portion of the community is more predisposed to labyrinthine necrosis than the female, in the proportion of 3 to 1. In Bezold's statistics the proportion is 2 to 1. Why there should be this apparent predisposition to labyrinthine necrosis on the part of the male might be a matter for some speculation.

It will be seen from the tabulated list that in four cases the entire labyrinth was involved in the sequestrum, and all these patients recovered (Nos. VI, VIII, IX, and XV). In the others the cochlea was chiefly involved.

Facial paralysis is noted as occurring 12 times out of 17 cases. Had it been present in the others, it would probably have been mentioned. Of these 12 cases of facial paralysis, recovery was complete in 4 cases; improving in 2; while the paralysis was permanent in 6.

Two of the cases—viz., Kretschmann's, No. V, and Toeplitz's, No. XII, are instances of primary labyrinthine necrosis. This is interesting, as there are only other 2 cases recorded where the labyrinth was primarily involved—1 mentioned by Bezold (Christenneck's case at Schwartz's Polyclinic); the second is mentioned by Toeplitz (Trautmann's case)—making a total of 4 cases.

I have already referred to No. XIII on the list, where there was a bilateral loss of the cochlea. The only other recorded instance is mentioned by Gruber in his text-book on *Diseases of the Ear*, p. 418. I have also, on a previous page, given an epitome of the history of case No. VIII (Turnbull's), which is interesting on account of the extensive paralysis which occurred, and also that on the *right* side a sequestrum was removed from the mastoid process, while on the *left* side the entire labyrinth was exfoliated.

To revert to my own case, I would like to draw attention to the length of time of the primary otorrhœa, dating back to an attack of measles in childhood, though possibly the involvement of the labyrinth only dates from the attack of "acute inflammation" two years ago. The length of time which elapses from the apparent involvement of the labyrinth to the extrusion of the sequestrum is important, its chronicity leading one to hope that there is a thickening of the dura mater to act as a protective barrier. In the present case, most probably there was an interval of two years. On the

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other hand, take case No. XIII, of Emanuel Max, where the exfoliation of the sequestrum, after the acute symptoms had set in which seemed to point to the involvement of the labyrinth, was remarkably rapid, being on the left side after an interval of three months, and on the right side after an interval of seven months. As already mentioned, the patient died from meningitis.

The prognosis in these cases of labyrinthine necrosis is much more favourable than at first one would be inclined to suppose. A mortality of 15 per cent (I am including Bezold's statistics with my own) is certainly not high when one considers the situation of the lesion. Not only so, but, in reading over the literature of the subject, one is impressed with the fact that, in the great majority of the cases, after the removal of the sequestrum, the suppurative process is materially lessened—in many of them it ceases altogether. Again, take the facial paralysis which was such a prominent symptom in many of those patients, while in some instances it was permanent, in others it was only transient. Even in the cases where the canal for the facial nerve was involved in the sequestrum, and its removal must have resulted in severe laceration of the nerve, there are cases recorded where, after a time, the nerve has partially or entirely recovered its function. As an instance of the recuperative power of the nerve, take Mr. Pye's[1] case where he removed the whole of the left labyrinth, as a sequestrum, through an opening in the mastoid process. There was facial paralysis, complete, to all the muscles supplied by the portia dura, including the tongue. In about ten days after the operation there was a marked improvement, and at the end of two months the facial paralysis had obviously greatly diminished.

CASE OF DIPHTHERIA IN WHICH THE SERUM WAS USED—TRACHEOTOMY—RECOVERY.

BY DAVID R. OSWALD, M.B., C.M., KINROSS.

J. W., æt. 5 years, was first seen by me at 11 A.M. on Friday, 19th July. Her mother informed me that the child had been ailing for four or five days previously, but had only been

[1] *British Medical Journal*, June, 1885.

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confined to bed since the afternoon of the previous day. She complained of a sore throat, difficulty in breathing, and of a distressing croupy cough. On examining the throat, the fauces and tonsils were found to be very much inflamed, and occupying the centre of the left tonsil was a grey patch of about the size of a threepenny piece. The breathing was very laboured and stridulous, and every few minutes the child was distressed by a hard, croupy cough. The pulse was 130 per minute and very weak; temperature, 100° F.; respirations, 30; lungs and heart normal. I had evidently to deal with a case of diphtheria, and as it was clear that the disease had already made extensive progress down the windpipe, I at once wired to Messrs. Young, Edinburgh, for a supply of the antitoxin serum, and, pending its arrival, put the child on the usual remedies—iron and chlorate of potash internally, and ordered the throat to be sprayed with the solution of peroxide of hydrogen. I ordered at the same time beef-tea, milk, and brandy *ad libitum*. At 7 P.M. I again saw the child, and found all the symptoms aggravated, the breathing more distressed, the face becoming cyanosed; temperature, 100·4° F.; pulse, 152 per minute, weak and irregular. The patch on the tonsil was the same—quite firm, and with no sign of separating. I therefore injected 10 c.c. of the serum, choosing the loose skin between the shoulder blades for the insertion, at the same time stopping all treatment by drugs. At 11 P.M. all the symptoms were still more aggravated; pulse, 168; child tossing about and fighting for breath; cyanosis of face more marked; temperature could not be taken because of the restlessness; and altogether the child had to all appearance only a very short time to live, unless something were done speedily to give relief. I obtained the ready permission of the parents to perform tracheotomy; indeed, they begged me to do something to give the child even temporary relief. At 11·30 P.M., with the assistance of Dr. Smythe, I opened the windpipe as far down as possible. As the child was so weak no anæsthetic was used, but almost before the first incision had been made the child ceased to breathe, and the operation had to be hurriedly finished and the tube inserted. Artificial respiration was then begun; but it was not till a soft rubber catheter was inserted through the tube and well down the trachea that air began to pass out and in. The artificial respiration was kept up for a time through the catheter, but, as the child showed signs of natural breathing, the catheter was withdrawn, and almost immediately she coughed up a piece of membrane

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through the tube, which, on being pulled out, appeared to be a complete cast of the trachea and bronchi. The pulse, which for a time could not be felt, gradually came back, and the child breathed quietly and naturally through the tube. A little brandy was then given and the child put back to bed, after which it almost immediately fell into a quiet sleep.

20th July.—6·30 A.M.—Child had rested well and taken some nourishment—brandy, beef-tea, and milk. She appears to be quite comfortable, playing with her doll. She had coughed up through the tube a good deal of blood-stained mucus and shreds of membrane. Pulse 130, stronger and quite regular. Temperature, 99·2° F. The patch on the tonsil almost gone. As a precautionary measure, I injected 5 c.c. more of the serum into the abdominal wall.

2·30 P.M.—Child not so well as in the morning; more feverish. The patch on the throat is quite gone, leaving a small clean ulcer, and she continues to take nourishment well. Temperature, 102° F.; pulse, 130; respirations, 30; still coughing up frothy mucus slightly blood-stained; lungs free.

11 P.M.—Temperature, 101·5° F.; pulse, 124, stronger; child looking better.

21st July.—7 A.M.—Temperature, 99·2° F.; pulse, 108; slept well.

1·30 P.M.—Temperature, 99° F.; pulse, 108.

10·30 P.M.—Temperature normal; pulse, 108.

22nd July.—11 A.M.—Temperature normal; pulse, 100.

11 P.M.—Temperature normal; pulse normal. A little clear mucus only now coming through the tube; very little cough. The child's appetite is now returning, having eaten during the day one or two small pieces of bread and jelly with relish, besides having taken large quantities of milk. She plays with her toys, and in every way appears to be improving. On closing the tracheal tube, some air passes with difficulty through the natural passage. As I had arranged to leave for a holiday, Dr. Laing, my *locum tenens*, took charge of the case, and he reported on my return that the child had gone on steadily improving. He attempted to remove the tube once, but it brought on such an attack of dyspnœa that it had to be reinserted. At this date (9th August) the tube is still in, but on closing the tube with a small cork, the child can now breathe comfortably through its mouth; can speak clearly and

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distinctly, and I hope in a day or two to be able to withdraw the tube altogether. I sent a piece of the membrane, coughed up during the operation of tracheotomy, to the British Institute of Preventive Medicine, whose serum I used, and Dr. Ruffer reports "that he was able to isolate the bacillus diphtheriæ, and that the case was therefore one of genuine diphtheria."

Note.—For various reasons, I did not consider this a very favourable case to try the new remedy on. Before the serum could be got, and indeed when first seen, the child was almost beyond hope. In the first place, the membrane appeared to be invading the trachea more than the tonsils or fauces. But even in the short space of time—a little over four hours—between the injection of the serum and the operation of tracheotomy, the remedy had already begun to have a beneficial effect, as evidenced by the free manner in which the membrane became detached during the operation. Then, again, the operation of tracheotomy was undertaken under most unfavourable circumstances. The child was almost moribund, and it was a wretched house of virtually only one apartment, with no facilities for nursing, and the only available light being a "tallow dip" held by a shaking neighbour woman. Under these circumstances one could hardly have expected any better result from the tracheotomy than to give the child an easy death, and, under the old *régimé*, I would have been very doubtful about undertaking the operation in the circumstances. The after progress of the case was almost marvellous—the child was practically well next morning—and I have no hesitation in ascribing the rapid recovery to the serum. The first dose did not appear to put the child about in the smallest degree, and although the temperature went up some degrees after the second injection, it very soon fell again. I may say that no drugs were given except one dose of castor oil after the first injection of the serum, and they could have had no appreciative effect in the short time they were given before the serum was used. Dr. Laing informed me that, on the tenth day, the child's skin became covered with a bright rash, but that it passed off in the course of forty-eight hours, and no desquamation followed.

12th August.—The tube was removed yesterday, and to-day the wound is practically healed, and the child convalescent. There is as yet no signs of paralysis.

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INSURED LIVES AS AFFECTED BY GOUT.

BY E. J. MARSH, M.D.

[This report, prepared by E. J. Marsh, M.D., for Richard A. M'Curdy, Esq., President of The Mutual Life Insurance Company of New York, has been sent to me as Chief Medical Referee of the Company in Scotland. As a record of results of the greatest importance to all interested in life insurance work, I have thought it right to give the report a wider publicity in the pages of the *Glasgow Medical Journal*. To this, at my request, the President of the Company has kindly given his consent.—JOHN LINDSAY STEVEN, M.D.]

AT the suggestion and request of the General Manager, I have read the report of the Actuary on the experience of the Company with gouty persons, and have carefully considered the medical aspect of the subject. His records show that 48 gouty persons have been insured in this Company between 1884 and 1888, and that from these risks the pecuniary loss to the Company has been four times greater than what he considers the normal loss should have been. He has subdivided the risks according to the duration of the insurance, the ages of the insured, the proportionate height and weight of the insured, and the date at which they were accepted, and in all these divisions finds the same extraordinary increase of loss, and the presumption remains that this increased mortality is due to the fact that the lives of the insured were deteriorated and shortened by their gout. The number of cases is too small to admit of much generalisation, and therefore I have carefully gone over each individual case to see whether this view would be sustained, or whether there were any other circumstances which might account for the loss. Gouty persons have always been looked upon as poor subjects for insurance, and medical opinions are almost unanimous that gout tends to shorten life in the great majority of cases, while recognising the fact that, exceptionally, they reach to a very advanced age. The action and rules of the Mutual Life have always been in accordance with this medical opinion, and it was only in exceptional cases that anyone was accepted who had a gouty record. No medical examiner, however, would say that every person who might have ever had the slightest possible symptom of gout should be always uninsurable, and therefore, in a few exceptional cases, they have recommended the issuance of policies. How carefully this selection has been made, and how few such cases have been insured, appears

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from the report of the Actuary, that, up to the end of the year 1887, when over 300,000 policies had been issued, only 58 policies have been issued to 48 persons in whose applications was any statement indicating a history of gout. These 48 cases were undoubtedly considered the exceptional cases of gout that were safely insurable, and yet their acceptance has proved to have been very unfortunate for the Company. Most of these applicants were residents of our large cities, examined by skilful examiners, and many of them seen by the examiners of the home office.

The Actuary's figures of the Company's experience and loss are given from the pecuniary amount at risk and subsequent loss, rather than from the number of lives; and as this experience is very limited, and consequently liable to error, I have considered and examined the cases as lives rather than by policies. A few accidental losses from lives with a large amount of insurance might easily lead to erroneous conclusions. As an instance in point, the actuary has divided the risks by a definite period—those insured before 1872 and those after that date. In both these periods the loss is very excessive; in the latter, he states that the normal loss should have been 10,000 dols., while the actual loss was 40,000 dols. Now we find that, from 1872, 18 lives were insured in amounts ranging from 1,000 dols. to 30,000 dols. Of these 18 persons 2 died, and both held large policies—one 30,000 dols., the largest policy that had ever been issued to a gouty subject; the other had 10,000 dols. in two policies. Death had struck the largest policy-holders. The mortality might have been greater than it actually was, and the loss less than normal. Moreover, the first (30,000 dols.) was an unfit subject for insurance, and died from disease induced by his intemperate habits, three years after insurance. The circumstances connected with his life were concealed from the Company at the time of his insurance, and were only ascertained on investigation after his death. In the second case (10,000 dols.) there is uncertainty as to whether the applicant had ever had gout at all, although it was so reported at first. The matter was not entirely cleared up, but the applicant was accepted after consideration by the medical department at the home office on the certificate of his family physician that he had never *known* of his having had the disease. He died of acute pneumonia of two days' duration.

Of the 48 cases reported by the Actuary, I think that 4 should be omitted, as 1 was evidently reported as gouty by mistake, and the other 3 had never had any acute attack of

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gout, and the total number is thus reduced to 44. The history of the insurance in these cases, from the time of the first report of the existence of gout until they ceased to be members of the Company, is as follows:—Subdividing them according to the dates at which they were insured, of those insured from

1843 to 1858.		1858 to 1872.		1872 to 1887.	
Lapsed,	2	Forfeited,	1	Forfeited,	1
Forfeited,	4	Surrendered,	2	Surrendered,	1
Surrendered,	3	Died,	9	Died,	2
Died,	4	In force,	1	In force,	14
Total,	13	Total,	13	Total,	18

In the first of these periods four policies were issued for a term of a few years only, and expired by limitation or were forfeited, presumably when they had effected the temporary insurance which was intended. The other two periods do not include any of these term insurances, and may be taken together, with the remark that naturally there are more deaths and fewer policies remaining in force among those issued before 1872, owing to the lapse of time. Attention is especially called to the very small number of those who have forfeited or surrendered their insurance; of the 31 insured only 2 have forfeited, and 3 surrendered their insurance. I understand that this is far below the usual experience, and it may best be explained by the very circumstances that the persons are gouty and appreciate the fact that their lives are unsound, and it is therefore important for them to keep up their insurance, and the apprehension that if their policies should be terminated it would not be easy for them to secure others. Of the 44 cases insured 15 have died, a mortality of 34 per cent, which far exceeds that of the Company's experience in general. These 15 deaths are too few to generalise upon, and must be examined individually. The table on the next page shows a synopsis of the important facts in each case.

Gout usually makes its appearance in the fourth or fifth decade of life, though we find exceptional cases originating earlier or later. Five of these cases were insured when between 30 and 40 years of life, and among them we have both our worst and our best experiences. Two insured at 34 years of age died directly from "the effects of gout," as stated in the death proofs. Another insured at 39 lived

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No.	Age at Insurance.	Age at Death.	Duration of Insurance.	Cause of Death.	Remarks.
1	39	47	8·5	Dropsy.	In subsequent examination still reported as having rheumatic gout.
2	39	50	10·9	Heart disease.	
3	58	67	9·1	Dropsy.	
4	39	69	30	Apoplexy.	
5	34	35	1·7	Gout.	Application states that he had gout in foot about five years ago. Temperate and active in habits.
6	67	74	6·4	Pneumonia.	Gout in toes about four years ago; none before or since. Was subsequently examined and insured, and no mention is made of gout.
7	40	57	17·4	Tumour of liver.	
8	48	64	16	Heart disease.	Endowment at 65 years. Ten payments.
9	43	52	9·2	Heart disease.	Had rheumatic gout before 19 years of age. None since.
10	53	74	21·9	Heart disease.	About eight years ago thinks he had something like gout; was never laid up with it.
11	48	55	6·5	Pneumonia.	Ten year endowment.
12	34	49	14·3	Bright's disease and rheumatic gout.	
13	50	57	6·10	Pneumonia.	Death certificate mentions as other diseases asthma and gout. Father had gout. Ten year endowment advised.
14	50	54	3·3	Bright's disease.	
15	60	62	1·11	Pneumonia.	

thirty years, thus surpassing his expectancy of life. Two were insured when above 60 years of age. Neither reached their expectancy, or proved good risks to the Company, although in both cases there was little history of gout. Two cases only reached to 70 years of age; one of them was insured at the age of 67 and died at 74, after less than seven years of insurance; the other was insured at 53 and died at 74, with a duration of insurance of twenty-one years, nine months, which was more than the expectancy. The duration in these cases was as follows:—

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Under 5 years,	3
5 to 10 years,	6
10 to 20 years,	4
Above 20 years,	2
	15

Examining the causes of death, we find—

Gout,	2 cases.
Heart disease,	4 cases.
Bright's disease,	1 case.
Dropsy,	2 cases.
Apoplexy,	1 case.
Acute pneumonia,	4 cases.
Tumour of liver,	1 case.
	15 cases.

In two cases gout is described as the cause of death; but it is well recognised that diseases of the heart and of the kidneys, dropsy, and apoplexy frequently result from gout, and are the immediate cause of death in gouty subjects.

On examining carefully each individual case it is sometimes impossible to prove, and difficult even to suspect, that the gout had any influence whatever in hastening death. In the majority of cases, however, it not only appears probable, but may be reasonably inferred that the fatal disease and premature death were directly due to the gouty diathesis. A very careful study of the cases fails to show any other apparent cause for the excessive mortality.

The Actuary's report has shown that the actual loss from these gouty persons has been excessive. If they had been perfectly sound lives there would have been some deaths, and some loss; but, in addition to these, there would have been other deaths, two of them directly attributed to gout, and several others in which the influence of gout was considered proved. Moreover, these persons recognise the fact that their viability is impaired and the chances of average longevity diminished, and, consequently, seldom surrender or forfeit their policies, thus making a selection against the Company.

The Company's total experience is small, too small to establish general conclusions, and we would hesitate now to ascribe this increased loss to gout, and would consider that it might be the result of coincidences rather than cause and effect, were it not that our conclusions are borne out by the judgment of the physicians and the experience of other life

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insurance companies which have had more risks of this class. Of medical opinions I will give a few quotations from the most recent authorities:—

"The outlook for a gouty patient is hardly ever favourable.

"Commonly the course of the disease is ever a downward one, and may be cut short at any period by the rapidly coming organic degenerations, or by many of the accidental intercurrent maladies to which these patients seem especially liable.

"The earlier in life gout makes its appearance the more unfavourable it is for the subject."—*Longstreth, on Rheumatism and Gout*, p. 254.

"That gout shortens life in the majority of cases is unquestionable. The prognosis varies with the rapidity with which the constitutional dyscrasia is developed, and this rapidity will depend on the intensity of the inheritance and the mode of life. Some gouty subjects escape the vascular and visceral complications of the disease for a long period, although crippled and deformed by its articular ravages, and attain advanced age; others may succumb in comparative youth to its most profound lesions."—*W. H. Draper, in Pepper's System of Medicine*, vol. ii, p. 127.

"Gout has a decided tendency to shorten life, and insurance companies, being fully aware of the fact, are not backward in acting upon it by increasing the amount of premiums for the insurance of the lives of those who have suffered from this disease. Gouty patients sometimes live to a good old age, and occasionally in the latter part of their lives the fits become milder and less frequent. Examples prove the liability of gouty subjects to be suddenly cut off by comparatively slight accidents. I consider that even a single fit of gout, however slight, should be looked upon as an intimation that the patient cannot go on with impunity with his present habits of life; it is a warning that either he must change them or expect returns of the disease, which, as time advances, are certain to increase both in frequency and duration, and are likely to embitter and shorten existence."—*A. B. Garrod, Treatise on Gout and Rheumatic Gout.*

Sir Dyce Duckworth, in his recent *Treatise on Gout*, has a chapter on life assurance. He says that each case must be carefully considered by itself, but the question in his mind seems to be how far such risks are impaired, and at what extra rates they should be valued in accordance with the practice of English life insurance companies. In *The Medical Handbook of Life Assurance*, by Dr. Pollock and Mr.

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Chisholm, it is said that the tendency has been in past years to under-estimate the importance of extra risk arising from gout.

British Life Insurance Companies are accustomed to insure gouty subjects, charging such extra rate as may be deemed proper for each case, generally an advance of about 10 per cent. The Actuary has quoted Mr. Meikle as stating that "the mortality on lives charged extra for gout is greatly in excess of that for any other infirmity." I find, also, a "Report on Gouty Lives," drawn up in 1879 by the Actuary and Medical Officer of the Equity and Law Life Office. This Company had an experience of 73 cases in which an extra premium for gout had been required:—"Had these been healthy lives, and accepted at the ordinary rates, the deaths 'expected' and allowed for at the tables would have been 13; but, at the ages at which they were rated at the office, 16 or 17 deaths were allowed for. The number of deaths which actually occurred was 21. Of the 21 cases not one, even at the 'office ages,' reached the calculated expectancy, although a few nearly reached it. So that in these, the most favourable cases on the list, it is fair to assume from this point of view that the gouty constitution was instrumental in shortening life. This general survey confirms strikingly the conclusion to which the figures point—viz., that gout adds so seriously to the risk of premature death, that undoubted cases of the disease, or even those in which there is distinct reason to suspect its existence, ought not to be accepted at ordinary rates, or with so small an addition as three or five years as has hitherto been customary." The experience of the Equity and Law Life Office shows that an extra rating of 10 per cent in all cases of gout is not sufficient to cover the risk, and it is suggested that a rating of 25 per cent would be a proper rule. In a postcript to the paper the following addition is made:—"Since writing this paper I have seen the results of a similar investigation, made to test my conclusions, into the gout class of another Assurance Society, where the number of cases was 321 (the years of observed life were 3,984·5, or 12·4 on the average of each case), and the deaths 183. The experience derived from this body of facts, though less adverse than those given above, is strongly confirmative of my conclusions, both as to the need of a substantial increase of premium—probably not less than 20 per cent—and as to the close connection between the causes of increase and the causes of death."—*Dr. E. Symes Thompson, Med. Times and Gazette*, 1879, vol. i, p. 611.

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Judging, then, from the opinions of the most experienced physicians, and from the results obtained in the British companies which insure many gouty persons at higher rates, and from the experience of our own Company in a few selected cases, the insurance of persons with a gouty history and constitution is always hazardous, and even more hazardous than has been generally supposed. The rule of the Company's practice should be, as it has hitherto been, that such persons are uninsurable at ordinary rates, and on the plain life plan. If exceptions are made to the rule, they should be fewer and made with more discrimination than hitherto. In every case the presumption is against the acceptance of an applicant who has had gout, and the case must be proved to be suitable for an exception, after more than ordinary scrutiny and investigation. In this way the danger of loss will be reduced to a minimum. The cases which might form such exceptions cannot be defined, and each must be individually decided by the responsible Medical Adviser of the Company, but I think they should be limited to the following:—

1. There should be an entire absence of hereditary tendency.
2. The first attack of gout shall not have appeared before 30 years of age.
3. The attacks shall have been very few in number and slight in character, and that several years shall have elapsed since the last attack.
4. That the person shall not have had gravel, frequent uric acid deposits in the urine, or symptoms of lithæmia.
5. The habits must be abstemious, both in eating and drinking, and the applicant must have given evidence that he appreciates the necessity for this course of life.

Note.—At a recent meeting of the Life Assurance Medical Officers' Association, a paper on "Gout, and Life Risks," was read by Dr. J. Symes Thompson, and discussed by the other members of the Society. No new statistics were given, but the general tenor of opinion was in accordance with the views expressed in this report, the remarks and arguments dealing chiefly with the *amount* of impairment, and the increased rating that should be required.—*The Lancet*, 8th December, 1894, p. 1,348.

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PUBLIC HEALTH.

THE CLIMATE OF THE ISLES OF SCILLY, WITH SPECIAL REFERENCE TO THEIR SUITABILITY AS A HEALTH RESORT.

BY T. THORNTON MACKLIN, M.D. GLASG., D.P.H. CAMB.

THE group of islands known as the Isles of Scilly is situated about 27 miles W.S.W. of the Land's End, in Cornwall. The exact geographical position is in latitude 49° 55′ N. and longitude 6° 19′ W. Until recently very little was known about them by the public, and I think it is a perfectly safe statement to make that very few medical men have the smallest idea that there is anything special in their climate. Within the last ten years the progress of the narcissus culture in these islands has been so great—exporting as they do over 300 tons of cut flowers in one season—that the eyes of very many in the United Kingdom has been attracted towards them. Besides which many descriptive articles have appeared from time to time in various magazines and papers by visitors who have been struck with the peculiar charm of the islands. There has not been, however, any article treating of the climate of the islands, so far as I can learn, except one by myself, which was published in the *Lancet* of April, 1893, and from which article I will take leave to quote as I proceed.

At the outset, the following quotation from a work written towards the close of the last century by the Rev. John Troutbeck, chaplain to the Duke of Leeds, then governor of the islands, and published about 1795, will not only prove interesting in a general way, but also will serve to show that, as early as the end of the eighteenth century, the Isles of Scilly were recognised as having a finer and warmer climate than that of the mainland:—

"The air here being so brisk and healthful, that sickness is very seldom known amongst the inhabitants, it being fanned by the sea breezes proceeding from every quarter, and is not at all infected by unwholesome vapours arising from large marshy grounds; however, the sea fogs are more commonly seen here than in more extensive tracts of land.

"In the months of June and July the air is filled with offensive vapours, which are not easily dispersed, by the inhabitants burning seaweed to make kelp; and in the

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summer the air is sometimes exceedingly hot, on account of the reflections of the sun from the sand; and in winter the sand is apt to be blown up from the coves, which renders walking out very disagreeable when the wind blows hard without rain.

"It is never so cold here in winter as in England, Ireland, and other neighbouring countries. Frost and snow are very seldom known, and never continue longer than a few days. Frost seldom happens unless the air is calm, and it is generally gone after the sun has shined two or three hours. The summers are not scorching, by reason of the frequent summer breezes flying over the islands. The inhabitants know but little of sickness or diseases, for although the air has not been reckoned so good since the making of kelp was introduced, and as the seaweed, of which it is made, does not contain anything more noxious than a few particles of salt, so it has seldom been found to have any disagreeable effect on their constitutions.

"The people of these islands are seldom afflicted with ague, and a fever is very uncommon; but the small-pox and the measles are the most frequent and fatal distempers; hence those that are temperate live to a great age, but unhappily spirituous liquors are too much used in these little islands."

For twenty-five years there has been an observatory station, under the control of the Meteorological Office, on the largest island of the group—St. Mary's. From the first this was completely furnished with all necessary instruments, with the exception of a sunshine recorder. Since February of last year (1894) a sunshine recorder has been in position, the instrument having been obtained mainly through efforts on my own part and with the invaluable aid of T. A. Doniers-Smith, Esq., lord-proprietor of the islands. The monthly return of observations for the Meteorological Office passes through my hands, and from it I furnish the Cornwall County Council with a summary of the month's observations for their monthly climatological report for the county. The data, therefore, which I will furnish may be relied upon as being as accurate as any that can be obtained, and is all from official sources.

The data supplied will confirm all that Troutbeck has stated with regard to the salubrity and mildness of the climate, though his conclusions were arrived at before meteorology was known as a science, and probably without the aid of any instruments at all, except it might be a thermometer and barometer.

Dr. Theodore Williams, President of the Royal Meteoro-

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logical Society, states that "Meteorology is undoubtedly the basis of all sound climatology; and the results of a patient observation of temperature, of moisture, of air pressure, and of wind for a series of years, are the best foundation for the claims of a place professing to be a sanatorium."

With the exception of the data relative to sunshine, all the statistics of climate which I will furnish are derived from observations extending over twenty years. Dr. Theodore Williams, in his Lumleian lectures on "Aëro-Therapeutics in Lung Disease," describes the principal factors of climate as follows:—

"1. Latitude—naturally the greatest influence, as describing the position of the sun towards the earth in a certain region, and thus determining the length and intensity of sunshine.

"2. Altitude, by which the effects of latitude may be to some extent neutralised, for even in the tropics, at a height of 16,000 feet, snow and ice may exist, the temperature falling in ascending mountains 1° F. for every 300 feet.

"3. The relative distribution of land and water, and especially the presence of vast tracts of either desert or ocean, the former accentuating extremes of temperature, and the latter tempering them.

"4. The presence of ocean currents flowing from higher and lower latitudes (as the case may be) and qualifying thereby the climate.

"5. Proximity of mountain ranges and their influence on the shelter from wind, and on the rainfall.

"6. The soil, its permeability or impermeability to moisture.

"7. The rainfall, its amount and annual distribution.

"8. The prevailing winds."

He next indicates what he calls the elements of climate, which are five in number:—(*a*) Temperature; (*b*) hygrometry; (*c*) atmospheric pressure; (*d*) wind force; (*e*) atmospheric electricity.

I will now briefly examine the relationship of the Scillies to these factors and elements as far as the material at my command will permit.

1. *Latitude.*—The Scillies lie to the south of England, and therefore have every advantage which their geographical position confers, as compared with the mainland of England.

2. *Altitude.*—This factor has no influence or bearing upon the Scillies at all, as no part of the habitable islands rises 200 feet above the sea level.

3. *The Relative Distribution of Land and Sea, &c.*—There is not any part of the five inhabited islands that lies more

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than 1 mile from the sea, hence the land has little or no modifying influence upon the temperature. The temperature of the islands is practically that of the air over the sea surrounding them.

4. *The Presence of Ocean Currents, &c.*—Dr. Williams says that the fourth factor is perhaps the most important of all, and certainly so to Great Britain and Ireland, for, without the influence of ocean currents, our climate would resemble that of Labrador. If, then, the Gulf Stream, the current which affects our shores, has the very marked effects, which is here indicated, upon the climate of Great Britain, how much greater must the effect be upon these small islands, whose shores are washed by this warm and genial current, and no part of which, as I have already said, is more than 1 mile distant from its waters? I again quote Dr. Williams, in his lectures above referred to, at this point:—

"It will be seen from Diagram 2, issued from the Meteorological Office, which is the result of numerous observations of the Channel water made at the various lightships and coastguard stations, that the temperature of the British and St. George's Channels varies according to the proximity of the Gulf Stream; the nearer to the stream, the warmer. The difference in water temperature between the sea off Scilly Isles and that of Sussex amounts to 5° F., the sea off the Norfolk coast being still cooler, and showing a difference of 10° F. from that of Scilly. The air temperatures follow the marine, being from 1° to 2° F. lower. There are few better instances of the warming and equalising effects of an ocean current than this, by which a northern island is made a participator in the warmth of the tropics, without their extreme heat."

I very much regret not being able to reproduce the diagram here referred to.

5. *Proximity of Mountain Ranges, &c.*—This factor, again, is not one which has any influence or bearing on these islands, except inasmuch as their absence indicates that no shelter is to be derived from such a source.

6. *The Soil, its Permeability or Impermeability to Moisture.*—This is a factor of considerable importance, as it influences not only the hygrometrical conditions, but also the temperature of the air. The Scillies have a light, loose, sandy soil, which is very permeable to moisture.

7. *Rainfall, its Amount and Annual Distribution.*—Mr. Scott, in his *Elementary Meteorology*, says that the three principal causes of rain are as follows:—(1) The ascent of a

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current of damp air, which is chilled by expansion as it rises; (2) the contact of warm and damp air with the colder surface of the ground; (3) the mixture of masses of hot and cold air.

The second of these is the cause which obtains almost invariably in the Scillies, and hence the rainfall is moderate in amount.

8. *The Prevailing Winds.*—This is an important factor as regards the Scillies, as they have a very marked influence on temperature. For nearly three-fourths of the year, S.W. and westerly winds prevail, and, of course, they are mild and frequently moist.

The elements of climate, as defined by Dr. Williams, will be discussed in greater or less detail under the following heads into which, in treating of the climate of the Isles of Scilly from the point of view of a health resort, I think my subject is most appropriately divided:—

1. Temperature.
2. Hygrometry.
3. Sunshine.
4. Rainfall.
5. Atmospheric pressure and prevailing winds.
6. Nature of soil.

1. *Temperature.*[1]—Mr. R. H. Scott, in an article in *Longman's Magazine* in June, 1892, on the climate of the British Isles, makes the following statement:——"The warmest spot, taking the whole year round, is the Scilly Isles. They are a whole degree warmer than either the west of Cornwall or the Channel Islands. . . . In winter the lines of equal temperature run generally north and south, the warmth lying to the south-westward." The geographical position of these islands is sufficient explanation of their superiority in this respect. This part of my subject naturally subdivides itself into two—(*a*) mildness of temperature; (*b*) equability.

a. Mildness.—The mean temperature for the whole year is 52·1° F.; the mean temperature for the winter months—*i.e.*, from November to April inclusive, is 47·05°. The mean temperature for the summer months is 57°. The mean minimum temperature for the whole year is 48·5°, and the mean maximum temperature for the whole year is 55·5°. The absolute maximum throughout the twelve months in the year 1881, which is an extreme example, ranged between 54° and 70°, and the absolute minimum between 29° and 52°. But, to take the most recent example obtainable, that of last winter,

[1] *Vide* Table I in Appendix.

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which is widely recognised as a very cold season, the absolute minimum in December, 1894, was 35°, and the absolute maximum, 55°. In January, 1895, the absolute minimum was 28°, and the maximum, 53°; then in February, when the most extreme cold was experienced, the absolute minimum was 27° only, and the maximum, 46°. The normal mean temperature for February—*i.e.*, taking an average of twenty years, is 45·9°, and the mean of the current year was 37°. Considering the extreme degree of cold which was experienced throughout England and the Continent generally, this is, comparatively speaking, a moderate departure from the normal, and probably no other place, not even in the south of France, could show so small a departure from the average. This, however, is merely a pious opinion on my part, and cannot be substantiated by any figures at my command.

The two coldest months in the year are January and February—the mean for each being the same, 45·9°. The two warmest months in the year are July and August—the mean for the former being 60·3°, and for the latter, 61°. It will be noticed from the above that, while mild in winter, it is yet cool in summer, though this is not in any degree peculiar to the Scillies, but is the common characteristic of all coast stations, as has been pointed out by Bayard in his *English Climatology*, 1881-90.

b. Equability.—The mean daily range of temperature is 6·8°. If the months are taken separately it is found that the month showing the least mean daily range is October, with 5·9°, and April gives the highest, with 8°. Again, if the mean maximum daily range is taken, it is found to be 11·5°, April showing the greatest daily range with 15°, and November showing the least with 2°, the mean of the least daily range for the year being 3·5°. It will be remarked that April thus shows not only the greatest mean average, but also the greatest daily range.

The mean range of temperature for the whole year is 15·1°—*i.e.*, the difference betwixt the mean temperature of the warmest month and the coldest. While, if the six winter months are taken, the mean range is 3·7° only. I have already pointed out that the mean temperature for the six summer months is 57°, and the mean for the winter months is 47°, or a difference of 10 degrees. All these statistics demonstrate that equability is a marked feature in the climate of the Scillies. But I will turn now from meteorological statistics and adduce evidence of another kind to confirm these, and to demonstrate the contention that the climate of Scilly is both

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mild and equable is no mere matter of theory derived from statistics, but has been put to the test of practical experience.

Tropical, not to mention subtropical, plants will grow in the open air only where they are not exposed to very low or great vicissitudes of temperature. Here is a short list of such exotics grown in these islands, and more particularly in the Abbey Gardens at Tresco:—Anopteris glandulosus, of Van Diemen's Land; Correa virens—C. cardinalis and C. alba, of New South Wales; Araucaria Bidwillii—A. Cooki and A. excelsa, of Moreton Bay, Norfolk Island; Abutilon vitifolium, of Chili; Aloe Socotrina—A. Barbadoes and A. spicata, also very many other varieties from the Cape of Good Hope; Dasylirion aerotrichum, of Mexico; Dracæna draco, of the East Indies and Teneriffe; Puya lanuginosa, of South America; and Cassia corymbosa, of Buenos Ayres. This list might be very greatly extended by the enumeration of many other specimens of exotic flora. Over fifty species of mesembryanthemums clothe the rocks of Scilly, and eucalypti and bamboos grow well. There seems to be no possibility of doubting or disputing the positive proof which the growth—luxuriant growth, too, not mere existence—of these exotics furnishes of the mildness and equability of the climate of the Scilly Isles. They are unimpeachable evidence of the practical accuracy of the statistics brought forward. The means and methods of taking meteorological observations are liable to error, for it has been pointed out that the surface temperature of the ground is often from 5 to 10 degrees lower than that indicated in the minimum thermometer in ordinary screens. As the plants in and passing through the ground will feel and have to contend with the real temperature, their very existence is the best test of temperature, and, in the case of Scilly at least, is strong presumptive evidence that the thermometrical readings and the surface temperature correspond very closely.

To the above might be added the fact that the common hedges in the Scillies are Veronica, Enonymus, and Escallonia macrantha.

The potent factor in this remarkable mildness and equability of temperature is the all-pervading influence of the Gulf Stream, which bathes the shores of these islands. Then, again, the amount of land is so small and so cut up into islands, and the islands, again, so full of bays, or porthes, as they are called here, that the land has no modifying influence upon the temperature.

I will conclude this part by again quoting Dr. Williams, who said, while taking part in a discussion on Bayard's paper

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already referred to:—"Respecting the warmth of the sea-coast stations in winter, compared with those inland, it was interesting to observe the effect of the warm water in the south-west upon the temperature of the air on the neighbouring coast, the higher temperature of the air in the west, as compared to that in the east, being due to the warming influence of the waters of the Atlantic."

The following figures of average sea and air temperatures in the month of February at five stations, clearly showed this effect:—

	Sea Temperature.	Air Temperature.
Scilly Islands, . .	49°	47°
Falmouth, . . .	48°	46°
Torquay, . . .	46°	45°
Dover, . . .	43·5°	42°
Yarmouth, . . .	39°	40°

It would be noticed that the further places were removed from the influence of the Gulf Stream, the less mild their winter climate became.

For the year 1894 the lowest sea temperature recorded was 49° in February, ascending steadily and gradually to 59·5° in July, and remaining very much the same through August and September, being 59·3° and 59° respectively, after which it descended as steadily and gradually as it rose, to 57° in December. During the current year the sea temperature went as low as 44·2° in February, but rebounding to 49° in March, it ultimately reached 54° in May, or 1 degree only below the corresponding month in 1894.

2. *Hygrometry.*[1]—The mean value of the dry bulb temperature for the whole year is 52·3°, and of the wet bulb, 50·3°. The mean relative humidity for the whole year is therefore 86 per cent. It is, moreover, to be noted that, even in the hygrometrical condition of the atmosphere, equability is the distinguishing characteristic of these islands. For if the mean values of each month are investigated separately, the relative humidity is found never to exceed 88 per cent, and never to fall below 86 per cent. In this connection there are two points to which I wish to call attention, because they are a departure from the common experience of most places:—(1) The relative humidity of these islands is greatest in the summer months, whereas in other places it is least during the same period. (2) Then there seems to be some connection betwixt the amount of rainfall and the degree of saturation of

[1] *Vide* Table II in Appendix.

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the air with moisture as a general rule; but this is evidently not the case in these islands, for it is during the dry months the highest degree of relative humidity occurs, and during the wet months the lowest. Of course I must not be understood to mean that, during the time that rain is actually falling, the hygrometrical condition of the atmosphere is not relatively higher than during dry weather, but that the rainfall is not, as in most places, the principal factor in raising the relative humidity. In other words, that the degree of relative humidity is due to some other cause than the amount of rain in Scilly. I will take two places for comparison, one an island (Jersey) and the other on the mainland (Margate). In the case of Jersey the cold and wet months give an average of about 90 per cent, and Margate 86 per cent, whereas the warm and dry months give, in the case of Jersey, about 80 per cent, and for Margate 77 per cent. No doubt this peculiarity of little varying relative humidity accounts in some measure for our mild winters and cool summers—in other words, for the marked equability of temperature which is the distinguishing characteristic of these islands. It is also to be remembered that it is to this condition is due the fact that the day-time is less warm in summer, and the night less cool in winter than in most places.

3. *Sunshine.*[1]—As I have already indicated, I am unable to show the results of a series of observations, extending over a number of years, with regard to the very important matter of sunshine. It was only in February of last year that a sunshine recorder was obtained for this station, consequently there are but ten complete months available for the year 1894, and five for the current year.

During the ten months, from March to December of last year, 1,551·1 hours of bright sunshine was registered. This gives an average of 155 hours per month, and of 5 hours per day during that period. The following places exceed Scilly in the amount of sunshine for the same period:—Jersey by 68·5 hours, Guernsey by 39·9 hours, New Quay in Cornwall by 29·7 hours, and Falmouth by 7 hours. Then the following places fall short of Scilly in amount of sunshine:—Hastings by 32·5 hours, Westbourne by 43·4 hours, Eastbourne by 54 hours, and Torquay by 98·3 hours. As these places show at the top of the list, as compared with other stations in the United Kingdom, it will be seen that Scilly occupies a very good position, and enjoys a relatively large amount of sunshine. The month which showed the highest total hours of sunshine

[1] *Vide* Table III in Appendix.

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was May, with 254·3, being equal to a mean of 8·2 hours per day, and Scilly exceeded every other place. The month which registered the smallest amount was November, with 56·8 hours, or 1·9 hours per day, when Scilly was behind every other place on the above list. The total sunshine registered for the first five months of the present year amounts to 814·7 hours, May registering 301·4 hours, being in excess of last year, while March and April fall slightly behind last year with 166·7 and 174·2 respectively.

4. *Rainfall.*[1]—The mean for the year is 34·28. The wettest month in the year is December, with a mean fall of 4·02 inch; and the dryest month in the year is May, with a mean fall of 1·73. Probably the principal reason for this very moderate rainfall, as compared with other places on the south-west and west coasts, is the fact that the land lies low and offers no obstruction to the passing clouds. One point of interest and importance in connection with the rainfall here is that it is rare for rain to fall continuously for twenty-four hours. Still more uncommon is it for rain to fall continuously for two or three days on end; as a matter of fact, I do not know of any record to that effect. More common—indeed, the rule—is it for the rain to fall during the night and for the day to be fine, or the morning may be wet and the afternoon fine, or *vice versa*. The days on which even young children require to be confined to the house on account of rain are few and far between. I may at once say that there are very few days throughout the year in which the youngest, oldest, or most delicate person may not enjoy some time in the open air.

5. *Atmospheric Pressure and Prevailing Winds.*[2]—The mean value of barometric pressure for the whole year is 29·947, and the mean values for each month ranges from 29·856 in April to 29·996 in June. This shows that, taking one month with another, there is but little variation in atmospheric pressure, and that the range is small. But, on the other hand, it must be borne in mind that these islands lie in the district in which gales occur most frequently, the average being twenty-two per annum, and that at such times there must be a considerable range of pressure registered. I do not propose to enter into the relationship of atmospheric pressure and climate. In a general way a high mean is indicative of fine weather, and *vice versa*. Out of 28 stations in the United Kingdom, Scilly stands ninth in order from highest to lowest. It is further to be borne in mind that our prevailing winds tend

[1] *Vide* Table IV in Appendix.
[2] *Vide* Table V in Appendix.

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to keep the barometer low, notwithstanding which our relative position, as compared with other places, is comparatively high. The presumption, therefore, is that Scilly enjoys a proportionately large share of fine weather. I have unfortunately no satisfactory data of the prevailing winds, but Mr. R. H. Scott furnishes the following in his *Notes on the Climate of the British Isles*, for the south-west of England:—"In fifteen years there were 328 gales, and of these no less than 80 per cent were westerly—*i.e.*, ranging from S.W. to N.W., and the remaining percentage easterly—*i.e.*, ranging from N.E. to S.E., so that it is reasonable to infer that the prevailing winds are westerly, and that, too, in a very large proportion. This, however, is so much the general experience of all places bordering on the Atlantic, that the want of statistics is of less importance. Still, it would have been more satisfactory to have been able to show the exact proportion in which westerly winds prevail. These are, of course, warm and mild winds. The cold winds are north and east winds, as is the experience everywhere else in the United Kingdom, but even those are somewhat tempered in their bitterness by the miles of water they must pass over before reaching the islands. In places sheltered from these winds, as, for example, the Abbey Gardens, on Tresco, one can lounge about in comparative comfort and not be aware, so far as one's own sensations are concerned, that an east or north wind is blowing. Unfortunately the amount of shelter to be obtained from any wind is not great, and is of very limited area.

6. *Nature of the Soil.*—This is a local factor of much importance in estimating the climate of any place. Soils which hold and accumulate moisture have been shown to have a close connection with the production of diseases of the lung. Dr. Buchanan, in our own country, and Dr. Bowditch, in America, has placed this beyond dispute, I think. The porous soils are generally conceded to be the healthiest.

The whole of the islands are composed of granite, and much of the soil is made up of disintegrated granite. The soil is light, loose, and sandy. Thus it will be seen that it is neither very absorbent nor retentive of moisture, but, on the contrary, porous, easily and rapidly drained. A sandy soil is easily warmed, and has a tendency to accumulate heat, because it is not a very good heat conductor. This absorbed heat is, of course, given off by radiation at night, and is one of the factors which tend to keep the night warm. The ground is for the most part undulating, and rain disappears at once on the slopes, but even on the low lying and level parts water

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is found to lie for the briefest space of time. After the heaviest rainfall, in the course of an hour or two the most delicate person need have no hesitation in walking abroad, so far as any danger to damp feet is concerned.

Probably no consideration of the climate of a place would be complete without reference to the condition of the atmosphere as regards its purity or the reverse. And in this connection might be discussed Dr. Williams' fifth element of climate—viz., atmospheric electricity; but the subject is too vast and abstruse to be capable of satisfactory treatment within the limits of such a paper as this is. To this extent, however, I venture to refer to the subject. Under certain electrical conditions of the atmosphere, ozone is more or less freely produced, and the air of the ocean is said to have a more abundant supply of ozone than that over continents and cities. If this be so, then the air over these islands must be much more abundantly charged with ozone than any part of the United Kingdom or the Continent. A glance at a map showing the geographical position of these islands will establish this at once. Ozone is known to be a most powerful disinfectant and antiseptic, consequently any emanations from the soil, the product of putrefaction or decomposition, will be acted upon at once and destroyed, thus ensuring the purity of the air. But over and above this, the purity of the atmosphere in these islands is further insured by the fact that there are no public works and manufactories to contaminate the air, and the processes of agriculture, as ordinarily carried on, are not calculated to contaminate the air very much, even if much greater in extent than, from the limited area capable of cultivation, or at all events cultivated, takes place in the Scillies. Then there are the winds, to which the islands from every quarter are freely exposed, and which, Dr. Williams says, "serve a distinctly hygienic object in dispersing noxious exhalations, whether animal or vegetable, in permitting free evaporation, and thus preventing accumulation of moisture, and maintaining the circulation of the air, which is necessary for the purification of the atmosphere." I think the purity of the air of these islands is clearly established—indeed, it is highly probable that much of the ozone in the air finds but little occupation for its energies, and finds itself free to pass on to regions where its services are in much greater demand.

From a careful consideration of the statistics and data cited in the foregoing pages, I think I am entitled to summarise as follows. The climate of the Isles of Scilly is favourable

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to the claim of the place being considered a health-resort in respect to the undermentioned points:—

1. *Temperature.*—Mild and equable.
2. *Relative Humidity.*—Stable, that of a moist climate, though not in any degree excessive.
3. *Sunshine.*—Abundant.
4. *Rainfall.*—Moderate, and occurring under favourable circumstances for the health-seeker.
5. *Atmospheric Pressure and Prevailing Winds.*—Favourable, and not such as are calculated to try an invalid.
6. *Nature of Soil.*—Extremely favourable, and such as gives every facility for open air exercise on foot, and without danger of dampness.
7. *Purity of Air and Electrical Condition of the Atmosphere.*—Not to be surpassed anywhere, either at home or abroad.

The one weak point to be set against all the above favourable conditions is the general want of shelter from strong or cold winds when they do blow, and during the occurrence of such this want of shelter is a very serious inconvenience, and cannot be minimised. On the other hand, it is to be noted that cold winds are only about 20 per cent of the whole, and that gales, though numerous, there being an average of about two per month, are not as a rule long lasting. Indeed, very many are confined to the night season alone, and very rarely do they exceed twenty-four hours in duration. Then, again, a very large proportion of the total number occur in November and January, so that some months are entirely without any. Of course this is more especially the case during the summer months.

Snow is very seldom seen, and hardly ever lies any length of time; as a rule, it quickly disappears before the rising sun. When it is remembered that during the very great and prolonged cold of last winter the maximum degree of frost experienced here was 5 degrees, and that for two mornings only, it must be conceded that in ordinary seasons there can be little to try the invalid who may be wintering here.

In conclusion, I propose very briefly to consider the class of cases likely to be benefited by residence in these highly favoured islands. Life on the islands may, so far as climate is concerned, be very aptly compared to life on board ship, with this very great difference, that the conditions of living are much more favourable on the islands to that on board ship, where confinement in close and badly ventilated cabins is a contingency of more or less frequent occurrence. Then,

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if a steamer, there is the unpleasant smell and the continuous vibration caused by the engines; and in any kind of vessel there are noises incidental to the working of the ship. Then there is, for the invalid at least, the monotony of the voyage, and the want of ability to communicate with one's friends speedily and easily. The limited amount and want of variation in the exercise, too, that can be taken is a decided drawback. Then, again, there is the matter of food supplies. These at the very least can neither be so good or fresh as can be obtained on shore.

Dr. Williams, in his Lumleian lectures, already more than once quoted, says the cases in which sea voyages are indicated are:—"(1) Chronic pleurisy and chronic empyema; (2) chronic bronchitis; (3) various forms of scrofulous disease, including scrofulous phthisis; (4) hæmorrhagic phthisis; (5) tuberculous excavation, where the cavity is limited and the disease unilateral; (6) Neuroses, the result of overwork, and especially insomnia. With regard to the forms of phthisis specially benefited by sea voyages, I would place the scrofulous or strumous form first; next, the hæmorrhagic type, marked by limited consolidations and large recurrent hæmoptysis; next, the chronic unilateral cavity cases, without great local irritation. Whether sea air promotes the fibrotic process or no, I cannot say; but, to judge by my cases, contraction of cavities takes place very frequently during sea voyages. Cases of early consolidation do not progress so well as in certain other climates, though they do not fare badly."

I think that the climate of Scilly would suit such cases admirably, as, from what I have pointed out, the Scillies may be looked upon as quite comparable, though in many respects very much superior, to sea voyaging.

Then, lastly, for rachitic and delicate children, the free and open beaches and sands, and the breezy downs furnish a playground unsurpassed in health-giving qualities by any part of the United Kingdom. The limits of this thesis would not permit, nor, indeed, have I accumulated sufficient material to be of any value, in furnishing a detailed statement of cases which have been benefited by a more or less prolonged residence in these islands.

Before concluding, I desire to call attention to the fact that in the four years I have been resident in Scilly, there has been but one slight epidemic of scarlatina, which was quickly stamped out, two cases of typhoid fever, one of which was clearly imported, and one case of measles, and that for twenty years previously there is no record of any infectious disease.

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Troutbeck, from whom I quoted at the outset, says that small-pox and measles were the most fatal distempers amongst the islanders. At present, I do not know more than one person that bears marks of small-pox on her person in all the islands, showing that, in the last fifty or sixty years, small-pox has not occurred either very extensively or frequently. This comparative immunity from infectious diseases has no doubt in the past been in great measure due to the isolated position of the islands. This isolation is, of course, becoming less marked every year with the increasing business of the islands, and greater and better facilities for travelling. On the other hand, improved, enlightened, and ever-increasing sanitary supervision will have great effect in preventing the spread of infectious disease from one community and district to another, and the Scillies will still continue to possess that measure of isolation which their geographical position confers. This practical immunity from infectious diseases which the islands enjoy, added to the meteorological statistics and data which have been furnished with regard to the climate of the islands, is of importance, and the whole constitutes a claim to the islands being considered a health resort of no mean value.

APPENDIX.

TABLE I.

SHOWING THE MEAN VALUE OF THE DAILY MAXIMUM AND MINIMUM TEMPERATURE, AND OF THE MAXIMUM AND MINIMUM COMBINED FOR EACH MONTH, AND FOR THE WHOLE YEAR.

	Maximum.	Minimum.	Mean.
January, . . .	48·8	42·9	45·9
February, . . .	48·9	42·8	45·9
March, . . .	49·5	42·5	46·0
April, . . .	52·1	44·7	48·4
May, ...	56·3	48·2	52·3
June, ...	61·3	53·0	57·2
July, ...	64·4	56·2	60·3
August, . . .	64·9	57·0	61·0
September, . .	61·8	54·7	58·3
October, . . .	56·6	50·2	53·4
November, . .	52·4	46·7	49·6
December, . . .	49·5	43·4	46·5
Annual, . .	55·5	48·5	52·1

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TABLE II.

SHOWING THE MEAN VALUE OF THE DRY AND WET BULB TEMPERATURES, AND RELATIVE HUMIDITY FOR EACH MONTH, AND FOR THE WHOLE YEAR.

	Dry.	Wet.	Humidity.
			Per cent.
January, . . .	46·4	44·9	86
February, . . .	46·0	44·4	86
March, . . .	46·0	44·2	86
April, . . .	48·6	46·6	86
May, ...	52·7	50·3	86
June, ...	57·3	55·2	87
July, ...	60·2	58·1	88
August, . . .	60·9	58·8	88
September, . .	58·4	56·3	87
October, . . .	53·7	51·6	86
November, . .	50·0	48·0	86
December, . . .	47·0	45·1	86
Annual, . .	52·3	50·3	86

TABLE III.

COMPARISON OF BRIGHT SUNSHINE REGISTERED DURING THE TEN MONTHS MARCH TO DECEMBER, 1894, AT SCILLY, WITH OTHER STATIONS ALONG THE SOUTH COAST OF ENGLAND, AND IN THE CHANNEL.

(*Stations arranged in order of Greatest Aggregate.*)

	Jersey.	Guernsey.	Newquay.	Falmouth.	Scilly.	Hastings.	Westbourne.	Eastbourne.	Torquay.
	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.	Hrs.
March, . .	212·6	215·7	211·0	186·2	189·5	201·3	212·8	200·9	182·4
April, . .	172·8	191·3	196·0	178·6	177·6	179·9	182·0	178·0	169·9
May, . .	222·9	227·3	249·2	248·5	254·3	227·2	210·8	213·4	202·8
June, . .	201·5	209·2	174·7	188·0	178·0	194·2	172·5	192·5	184·8
July, . .	169·7	178·7	165·1	181·5	152·5	192·1	188·9	196·1	160·9
August, . .	192·7	183·3	168·4	164·8	181·1	151·2	161·0	146·8	157·1
September, .	173·0	162·3	171·9	165·5	189·6	127·6	138·8	124·9	156·4
October, . .	123·7	102·2	121·9	116·1	112·2	78·4	92·3	87·0	91·1
November, .	86·6	73·7	73·0	62·3	56·8	102·0	83·0	93·4	74·1
December, .	64·1	47·3	49·6	66·6	59·5	64·7	65·6	64·1	73·3
TOTALS, .	1619·6	1591·0	1580·8	1558·1	1551·1	1518·6	1507·7	1497·1	1453·8
	+68·5	+39·9	+29·7	+7·0	...	−32·5	−43·4	−54·0	−98·3

Scilly + or − each other station.

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TABLE IV.

SHOWING THE MEAN RAINFALL FOR EACH MONTH AND FOR THE WHOLE YEAR.

	Ins.		Ins.		Ins.
January, .	3·73	May, . .	1·73	September, .	3·41
February, .	2·71	June, .	1·84	October, .	3·70
March, . .	2·40	July, . .	2·46	November, .	3·72
April, . .	2·27	August, .	2·39	December, .	4·02

Annual, ... 34·38 ins.

TABLE V.

SHOWING THE MEAN VALUES OF BAROMETRIC PRESSURE FOR EACH MONTH AND FOR THE WHOLE YEAR.

	Ins.		Ins.		Ins.
January, .	29·969	May, .	29·974	September, .	29·971
February, .	29·959	June, .	29·996	October, .	29·910
March, .	29·947	July, .	29·974	November, .	29·897
April, .	29·856	August, .	29·962	December, .	29·951

Annual, . . . 29·947 ins.

Obituary.

JOHN HOWIE CARSLAW, M.A., M.D.

In Dr. John Howie Carslaw, one of the junior editors of this *Journal*, a peculiarly bright and promising career, distinguished at every stage while it lasted, has been brought to a premature close by a death equally unexpected and regretted by all who knew him. It would be vain for us, his more immediate friends and associates in this work, to insist upon the loss that we have experienced, while we know that the feeling as of an irreparable calamity has gone forth so widely among his fellow-students, his teachers and professors, and most of all, perhaps, among the many pupils whom he attracted of late years, in the University and Western Infirmary, by his quiet and unobtrusive, but always most efficient, service. All of these younger men had come to know, what their seniors had known all along, that here was a man of most brilliant powers, and most noble ambitions, who yet could so entirely forget himself in his work as to seem altogether like one of themselves. This combination of first-rate ability with modesty and diligence, not looking for immediate reward, is not perhaps extremely rare, but it

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impresses on the survivors, when such an one is cut off before he has had the opportunity of taking the place in the world which was his due, a more than common obligation to perpetuate, as far as may be, the memory of so valuable an example. To John H. Carslaw no work was so common, no task so small, as to allow of its being done otherwise than carefully and well. The absolute confidence which could be placed in his routine work, accordingly, was not less than that due to those efforts—unhappily only too few—to which his name is attached. And the power of a character working in this way—"unhasting, unresting"—with no thought of self, but only of doing well whatever came to hand in natural course, was of inestimable value as an example to the younger men with whom, in his University office under the Professor of Medicine, he had latterly so much to do.

The few dates and particulars which follow can only direct attention in some measure to what is known, or may easily be known, to all men of a life of which the genuine attraction and the too early passing away are all that can properly be noticed here, all else being, as it were, the private privilege of those who were of the inner circle of close and daily companionship.

John H. Carslaw was born in Helensburgh on 31st August, 1863, and had, therefore, at his death on 9th August, 1895, not yet completed his thirty-second year. His father, the Rev. William Carslaw, is the Free Church minister of the Park Church, Helensburgh, and several of his brothers had, like himself, a most distinguished academical career. John obtained his school education at Larchfield, Helensburgh, and afterwards at the Edinburgh Academy. He then passed to the University of Glasgow, and took the degree of M.A. in 1882, after earning several prizes in classes. His medical education, also in the University of Glasgow, was throughout distinguished by his earning medals in almost every department, and finally receiving the degrees of M.B. and C.M., in 1886, with honours. In the summer of 1886 he may be said to have made his first appearance in responsible practical work in hospital, by acting as *locum tenens* for the resident assistant in the medical wards of the Western Infirmary. In the autumn of 1886 he obtained, entirely on the ground of distinguished merit, the Foulis Memorial Scholarship, and as the result of this early success proceeded to Leipzig, and afterwards to Berlin and Strassburg, where he studied under Professors Ludwig, Koch, and Recklinghausen, devoting himself to the latest researches in physiology and pathology

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respectively. In October, 1887, he returned to Glasgow, and became a resident assistant in the Western Infirmary, under Professors Gairdner and Buchanan, fulfilling all his duties in the unobtrusive, and at the same time thoroughly efficient, manner indicated above. For nearly two years after this—from 1888 to 1890—he acted as a resident medical officer in the City of Glasgow Fever Hospital at Belvidere, and latterly became senior assistant physician there, under Dr. Allan. For three months in 1890 he acted as in-door house surgeon in the Glasgow Maternity Hospital, and then commenced practice on his own account in the West End of Glasgow, making numerous friends from the first. In 1891 he obtained his first experience as a lecturer, by conducting instructions in the Glasgow Board schools, on "Physiology in its relations to Temperance," services which were feelingly acknowledged by the Chairman of the Board, Sir John N. Cuthbertson, at its first meeting after his death. Other appointments followed rapidly on the above—viz., Dispensary Physician to the Western Infirmary and to the Sick Children's Hospital, by which the foundation was laid, apparently, for a long and useful career of important official work and invaluable experience. In 1893 he became assistant to Professor Gairdner, receiving an appointment from the University Court in the Systematic Class, while he also gave valuable aid in instructing the junior clinical students in hospital. In the same year he received the degree of M.D., with honours, his thesis being "On the Severer Forms of Scarlet Fever, with special reference to Antipyretic Methods of Treatment," a fruit of his personal experience in Belvidere Hospital. In the Glasgow Medico-Chirurgical Society, and also in the Pathological and Clinical Society, he gave most efficient service as editorial secretary, and many of the reports in our pages owe their completeness to his intelligent and ever-valued aid. His principal contributions (not anonymous) to medical literature are as follows:—1, "The Relation between the Density and the Effect as Irritants of Chloride of Sodium Solutions (*Archiv für Anatomie und Physiologie*, 1887); 2, "Rheumatism and Chorea, as Complications of Scarlet Fever" (*Glasgow Medical Journal*, 1891); 3, "On the Severer Forms of Scarlet Fever, with special reference to Antipyretic Methods of Treatment" (*Glasgow Medical Journal*, 1894); 4, "Case of Enteric Fever with Four distinct Relapses" (*Lancet*, 1890). In addition to the above, Dr. Carslaw did a large amount of work in the way of translations, abstracts, and other anonymous contributions for this *Journal*, and, up

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to within four weeks before the date of his death, may be said to have been constantly at work, either in practice or in some of the ways to which we have briefly alluded. He went at this time to take a holiday in the Upper Ward of Lanarkshire, in a charming offset of the Clyde valley, where his family had previously resided with similar objects, taking with him his wife and infant child as companions, and apparently bent only on rest and the enjoyment of a country life for a time. He was, however, seized rather suddenly with symptoms of subacute peritonitis in the lower abdomen, not without a strong suspicion of appendicitis, but ultimately proving otherwise. The symptoms, though severe, were not extreme, and it was hoped that by the formation of some limited abscess or other clear indication for surgical interference, if not by spontaneous resolution, a way would be found safely out of the danger. At last, after three weeks of suffering, it became apparent that, whatever the original cause, there was no possible way of escape except by an exploratory incision. This was performed as a last resort, but with the result of shewing that a very chronic ulcer of the small intestine had perforated quite recently into a limited peritoneal sac formed by older adhesions; and it was only too plain that no efficient relief could be afforded, the temperature having rapidly risen before the operation to 103° and 104°, while the strength of the patient was rapidly giving way.

We are confident that every reader of these pages will join with us in our heartfelt regret and sympathy with his parents, his widow, and his brothers and sisters, at the loss of one so dear to us all, and so much loved and respected in this medical school and neighbourhood.

CURRENT TOPICS.

THE LATE DR. JOHN HOWIE CARSLAW.—On another page will be found, from the pen of one well qualified to judge of his professional attainments and his lofty character, a brief memoir of Dr. Carslaw, Sub-editor of this *Journal*. To that memoir nothing can here be added, but the Editors have the desire to make special reference to the great loss which the *Journal* has sustained in the removal by death from its editorial staff of Dr. Carslaw. Much of the success of the *Journal* during the last few years was directly due to the untiring efforts of its Sub-editor. He had a large department

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of the *Journal's* work under his immediate control, and no one could have managed it more ably. Our readers can judge for themselves of the excellence of his reports of the meetings of our Glasgow medical societies, which we think have never been surpassed for fulness and accuracy in the history of the *Journal*, and which we know involved many hours of continuous toil, probably undreamt of by those who enjoyed the pleasure of reading them. He also edited the department of "Abstracts from Current Medical Literature," and we know that his relationships with the many gentlemen collaborating with him in this work were always most harmonious and cordial. In all respects he was an ideal medical journalist, and his death has created a blank on our staff which it will not be easy to fill. The Editors feel that they have lost not only a loyal colleague, but a trusted friend.

RUCHILL FEVER HOSPITAL.—The foundation stone of this new hospital, in process of being erected by the Corporation of Glasgow, on an open portion of ground recently acquired by them, and lying between Possilpark and Maryhill, was laid by Lady Bell, wife of the Lord Provost, on the afternoon of Thursday, 29th August, 1895, at 2 o'clock. In spite of a storm of wind and rain, which prevailed more or less all day, a large turn out of ladies and gentlemen witnessed the ceremony, which was gracefully performed by her ladyship. Bailie James Dick, Convener of the Sub-Committee on Hospitals, occupied the chair, and the Rev. Dr. Black, of Wellington Street U.P. Church, invoked the Divine blessing on the work. Mr. Thomas Mason, D.L., the contractor, presented her ladyship with the trowel with which she performed the ceremony. The company then had refreshments in a neighbouring marquee, on the roof of which a heavy rain battered all the time, and ultimately interfered with the comfort of those under the canvas. "Success to Ruchill Hospital" was proposed by Ex-Bailie Crawford, and responded to by Bailie Dick. "Our Medical and Nursing Staff" was proposed by Bailie Bilsland, and responded to by Dr. Johnstone and Mrs. Sinclair. Councillor Steele proposed the health of the Senior Medical Officer of Health, for whom, in his absence on account of illness, Dr. A. K. Chalmers replied.

Among the medical men present were observed Sir James Russell, Ex-Lord Provost of Edinburgh; Dr. Lapraik, Dr. Geo. R. Mather, Dr. M'Gregor Robertson, Dr. Wallace Anderson, Dr. Alex. Robertson, Dr. D. C. M'Vail, Dr. A. S. Tindal, Dr. John Lindsay Steven, Dr. Barras, Dr. A. K. Chalmers, Dr. Johnstone, and Dr. T. S. Meighan.

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MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING X.—5TH APRIL, 1895.

MR. HENRY E. CLARK *in the Chair.*

I.—PATIENT WITH TRANSPOSITION OF ABDOMINAL AND THORACIC VISCERA.

BY DR. JAMES P. BOYD.

Dr. Boyd showed this patient and gave the account of the case, which appears as an original article at p. 89.

Dr. Samson Gemmell spoke of the rarity of the condition described. He had himself had practically no experience of transpositions of this nature, but knew of Allen Thomson's case, and had heard him speak of it. The present case seemed to be a very complete one, and it would be interesting if Dr. Boyd could follow it up so as to elucidate the facts about the viscera even more fully than could be done in the living subject.

Mr. Clark was interested in the case from the anatomical standpoint. As Allen Thomson pointed out, such transposition was almost invariably associated with the development of the right aortic arch and its permanence (possibly because of some arrest of growth on the other side) as the effective aortic arch.

Mr. Clark was interested in another fact which he had noticed in examining the patient—namely, that the right testicle was hanging lower than the left. Much discussion, scientific and not scientific, had taken place on the question as to why the left testicle was usually lower than the right, and among other suggested explanations was that which regarded the fork of the trousers as a cause. Here was a lad, whose trousers were worn in the usual way, and yet his right testicle was the lower of the two. Mr. Clark, like other anatomists, had always said that there must be some other explanation, possibly connected with the blood-vessels.

Allen Thomson's paper, quoted by Dr. Boyd, was interesting in many ways, and attention might also be drawn to the poem

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on the subject, given in a foot-note, and ascribed to the printer's devil.[1]

Another point which had been mentioned by Dr. Boyd was that the patient was right-handed, and not left-handed, as one might have expected. The right side of the chest had also been noted as larger than the left. The right side of the chest was supposed normally to be larger, because of right-handedness. The fact that the present patient was right-handed supported the view that right-handedness was, in general, the result of habit and education, and not a constitutional or physiological condition, as some had suggested.

II.—SPECIMENS FROM TWO CASES OF HÆMORRHAGE IN THE PONS, OCCURRING UNDER OBSERVATION IN THE ROYAL INFIRMARY.

BY DR. D. C. M'VAIL.

Dr. M'Vail, in giving an account of the clinical history of these cases, said that in the first the patient, a man of 60, had been in his wards since August, suffering from chronic renal disease, with œdema, considerable albuminuria, and diminution in the amount of urea excreted. Occasionally nervous symptoms had been observed. Thus, there had been Cheyne-Stokes breathing, with temporary recovery from it, recurrence, and again recovery. At the end of the year they had thought that he would have been able to go home, but, on the last day of December, in the afternoon, there was a sudden development of extreme symptoms. His breathing suddenly became difficult and irregular, he seemed about to choke, could not swallow phlegm that collected in the back of the throat, and Dr. Mackay, resident physician, promptly pulled out the tongue, passed a thread through it, and swabbed out the throat with a probang sponge. Dr. M'Vail saw the patient one and a half hours after the onset. Unconsciousness was absolute, and dyspnœa and urgent throat symptoms were as if a piece of meat had become fixed in the gullet, and he were making great, though unconscious efforts to get it out of his mouth. His breathing at that time also was irregular, but no tracing was taken of it.

The patient lived until the following morning about ten o'clock without much alteration in symptoms.

Diagnosis during life had been of hæmorrhage—at least as low as the pons. This was confirmed by the *post-mortem* examination.

It might be mentioned further that the pupils were both

[1] See *Glasgow Medical Journal*, 1853, vol. i, p. 216.

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contracted to a small point, just as in opium poisoning. That was sometimes the case in bulbar hæmorrhage, but there was no absolute rule. In those basal cases very high temperatures were frequently recorded. In the present case the maximum had been 100·4°, and that must be regarded as exceptionally low.

In the second case the diagnosis of bulbar hæmorrhage had been made by Dr. Mackay, from his recognition of the similarity between it and the preceding case. The patient, a man of 49 years, though he looked older, came to the Royal Infirmary, having been sent as suffering from albuminuria. On arrival about 3 P.M. he had been quite well and spry, walking about the waiting-room and talking to those around him, when suddenly he sank on the floor and became almost immediately unconscious. Dr. Mackay then observed the same conditions as to respiration and choking as were noted in the former case, and had adopted the same treatment. Dr. M'Vail saw the patient two or three hours afterwards, and he did not feel warranted then, from the symptoms at that time present, in stating definitely that the case was necessarily one of bulbar hæmorrhage; as, although patient was absolutely unconscious, breathing was regular, though shallow. At that time there were no choking symptoms, but he held Dr. Mackay quite justified, from what he had seen, in regarding it as bulbar. Death took place next morning at 3 A.M. His breathing had not again become irrregular; shortly before death it had become deeper. In this case the temperature did rise high—to 106·8°—and that was quite in keeping with the usual recorded cases of bulbar hæmorrhage. The pupils in this case also were small throughout.

When one looked at the specimen from this case, it seemed strange that the patient should have lived so long with his brain so completely cut off from the medulla. He had been living really on his medulla oblongata and spinal cord.

Dr. Mackay read the notes from the *post-mortem* journal of the Infirmary. In neither had there been much disease of the blood-vessels.

Dr. M'Vail, in remarking further on the cases, said that they had both been sent into hospital as cases of albuminuria, and the first had been interesting, even as a kidney case, in view of many variations and tendency to Cheyne-Stokes breathing. In connection with the bulbar hæmorrhage, one had the common rise of temperature, while the other had not.

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During the time when the first case was lying unconscious, there happened to be, in an adjoining bed, a patient also in deep coma, but otherwise offering a marked contrast. This latter patient had been noticed in the street to swing round, and to be about to fall, but he had been caught in time to prevent injury. His condition on admission was typical of "apoplexy;" his respiration was regular and stertorous. It had been very striking to see the difference in this respect between the two patients. The pupils, too, in the "apoplexy" case were very lively. He died before the bulbar case, although his attack had come on at the same time. At the *post-mortem* they had found what would formerly have been called "serous apoplexy," but no hæmorrhage could be discovered. There was a large accumulation of serum on the surface of the brain and in the ventricles. This man, too, had had albuminuria, but had been in fair condition when his seizure occurred.

Dr. Dalziel asked what term Dr. M'Vail would now use for "serous apoplexy."

Dr. M'Vail said he would be inclined to regard it as "serous compression," though why the serum should have forced itself out and compressed the brain was a question for the pathologists. The term "apoplexy" was now rather restricted to hæmorrhage and embolism, but neither of these had been found in the case referred to. No doubt the cerebral condition was connected with the renal mischief. There had been no opportunity for estimating the urea in the urine, and thus he could not tell to what extent the man was being poisoned with urea. Urea had been found in the fluid removed from the brain at the *post-mortem*.

Mr. Clark supposed that, in the last-mentioned case, there had been compression from sudden displacement of serous fluid, and not from sudden effusion.

Dr. M'Vail could not see why there should be sudden displacement, because the man had not fallen so as, by any blow to the head, to have *displaced* anything within the cranium. It seemed more probable that there had been a sudden effusion.

Dr. Rutherfurd asked if he had been œdematous otherwise.

Dr. M'Vail replied that he had not been œdematous to any extent when under observation.

Dr. J. W. Allan asked if there were any history of previous cerebral symptoms, and was answered in the negative.

Dr. Samson Gemmell asked if there had been any convulsive movements, and was answered in the negative. He suggested

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that the attack described might have been uræmic, and that the effusion might have taken place during the period of residence in hospital.

Dr. M'Vail said that there had been nothing approaching to a uræmic convulsion, but that the condition was probably uræmic, and that during life the case looked like an ordinary apoplexy.

Dr. Rutherfurd thought that Dr. Gemmell's was a feasible explanation, and that serous effusion might have supervened on uræmic symptoms, although having nothing to do with their causation.

Dr. M'Vail said that the amount of the serous fluid was so great, and the brain was so evidently compressed by it, that it was impossible to escape the conviction that the symptoms had been due to compression.

III.—THREE SPECIMENS OF VERMIFORM APPENDIX REMOVED BY OPERATION.

By Dr. T. K. Dalziel.

Dr. Dalziel showed three fresh specimens of the vermiform appendix removed by operation, each illustrating a different pathological condition.

Case I.—W., aged 10 years, suffered from occasional attacks of colic for two years, and, for three days before operation, had had violent and continuous abdominal pain, somewhat relieved by the treatment of Dr. Anderson Robertson, who diagnosed appendicitis, and with whom I saw the case on Saturday, 27th March, 1895, when the lad had every appearance of being seriously ill, with the drawn, pinched features, anxious expression, and dull grey complexion, so typical of septic abdominal mischief. The abdomen was swollen and tender, especially so on pressure over the right iliac region. Patient complained of pain on micturition. The other features of the case were those of acute peritonitis. Pulse extremely rapid—about 130 per minute, and temperature only a little above normal—at 99·8°.

From the nature of the pain and its localisation in the early stage, from the course of the temperature, and evidence of peritonitis of a very violent type, we had no doubt but that the case was one of perforation of the appendix, and that the perforation had occurred some days before operation, giving rise to a localised abscess which, on the night before operation, had burst into the general peritoneal cavity.

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We had the patient removed at once to the Nursing Home, and performed abdominal section by an incision 3 inches long at the outer border of the right rectus muscle. The intestines were found matted together with purulent lymph, but the appendix was easily found by following down the middle longitudinal band of the cæcum. A quantity of pus surrounded the appendix, which presented a punched-out-like perforation, through which projected an orange pip, while three others could be felt in the interior. The wall of the cæcum, in contact with the appendix, presented numerous discrete abscesses, which were scarified, evacuated, and powdered with iodoform. The appendix was ligatured and removed; the peritoneal cavity thoroughly irrigated; and a considerable quantity of pus was removed from the pouch of Douglas. The right iliac fossa was stuffed with a large quantity of iodoform gauze, and a glass drainage-tube placed into the pelvis. The patient soon rallied from the shock of the operation, and, for forty-eight hours, exhibited a continuous improvement in his general condition—the pulse becoming slower, temperature recovering from the subnormal state following the operation. On the third day, however, persistent hiccough set in, indicating an extension of the peritonitis into the higher abdominal zone, though without any increase in abdominal distension. The pulse again became weaker and more rapid, and the lad died on the fifth day after operation.

Case II.—O., aged 21 years, had suffered from occasional attacks of abdominal pain, especially one severe attack six months previously, which confined the patient to bed for a week. The patient lived in terror of recurrence of these attacks of pain. The last attack Dr. Anderson Robertson diagnosed as appendicitis, and I was asked to see him on 30th March, 1895. Two days previously the patient was seized with violent abdominal pain, general at first, but soon referred to the region of the appendix, pressure over which elicited distinct tenderness. Pain on micturition—a common feature in such cases—was also complained of. The temperature and pulse were not markedly altered—the former was elevated to 99·6°.

The case was looked upon as one of appendicitis, and, though not of very great urgency, it was deemed advisable to remove the appendix on account of the recurrence of the painful and troublesome condition.

On the 30th March an incision 2 inches long was made at the outer border of right rectus muscle, and the appendix easily found and ligatured and removed, a fold of mesentery

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being stitched over the stump. The appendix was swollen, markedly œdematous and reddened, and had near the base a slight coating of lymph. The patient made an uninterrupted recovery, and left the Home four weeks after operation with a firm linear scar, having had absolutely no discomfort during convalescence referable to the operative interference.

CASE III.—P., aged 23, had suffered for four years from extremely violent attacks of abdominal pain, recurring every two or three months, and for one whole year preventing the patient from following his occupation. Lately the attacks had become so frequent as to be almost continuous, and, during the intermissions, a distinct sense of discomfort prevailed. The pain, while at times general, was constantly referred to the right iliac region. The patient was in good health and fairly well nourished, temperature and pulse being normal. Constipation had given trouble since childhood. He had no pain on micturition. A tumour could be detected on palpation in the right iliac region, and, being in the situation of the appendix, its sausage-like shape and mobility led us to the diagnosis of enlargement of that structure. In the Nursing Home, on 1st April, 1895, the enlarged appendix was removed through an incision 2½ inches long at the outer border of the right rectus muscle. The patient made an uninterrupted recovery, and was dismissed at the end of four weeks, having enjoyed the first month in four years entirely free from pain and discomfort.

The appendix presented a globular swelling near its extremity. It was smooth and pale on the surface, its walls being markedly hypertrophied, and the lumen of the organ so much diminished near its attachment to the cæcum, that a probe could be passed only with some force. The condition seemed probably due to some old catarrhal or ulcerative condition of the mucous membrane, leading to stricture, with subsequent retention of secretion, and appendicular colic of such severity as to render the patient a useless member of society—a condition from which the removal of the affected structure has relieved him. He is now well and free from suffering.

Dr. Renton was much interested by Dr. Dalziel's cases. The first, in which the vermiform appendix had given way, was quite in accord with one in which he (Dr. Renton) had operated some months previously. He had with him the ruptured appendix and the concretion which had come out at the time of operation. The patient was a child of 7 years, who had taken ill on a Friday, and on the Tuesday Dr. Renton

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had seen the case with Dr. Campbell and Dr. Garnett Wilson. The abdomen was then much distended, and presented all the appearances of acute peritonitis, there being evidence of fluid in the peritoneum. It had been clear that, if nothing were done, death would soon ensue, and that the only chance, and that a bare one, was to open the abdomen. On this being done, the peritoneal cavity was found full of pus, and the vermiform appendix so gangrenous that it gave way when first tied, and had to be ligatured again. The patient sank just as Dr. Dalziel had described in his case.

Such cases were illustrative of a very serious condition, and the great question in connection with them—a question with which Dr. Dalziel had not dealt—was as to when one should operate in appendicitis, *plus* generalised peritonitis. There were many cases of catarrhal appendicitis, and of acute appendicitis with a limited amount of peritonitis, which were safe to leave alone for a certain length of time. They were localised, and might lead to localised abscess. The most serious cases, however, were those in which the vermiform appendix gave way suddenly, with or without a previous attack of appendicitis, and acute general peritonitis resulted. How long should such a patient be allowed to fight on? Dr. Renton's opinion was that, when such a condition existed, and when, on the third or fourth day, the temperature was high and the pulse relatively low, the sooner the abdomen was opened the better. The opening of the abdomen did no harm of itself. Unfortunately there was an impression that, if an operation undertaken in such circumstances was followed by death, it was the operation which was unsuccessful. That was a mistake. It was the disease that killed the patient, and the operation had not been performed soon enough. If there was any case in which the physician and surgeon should be associated early, it was in such a case as this. Many physicians had a dread of proposing such a serious operation; some apparent improvement might be noted and led to delay, and thus valuable time was lost. He wished every one to appreciate the tremendous danger of such delay. If the peritoneal condition was spreading, it was wise to get in a drainage-tube, even though one could do no more; it was not always even necessary to find the appendix. His plan of finding the appendix was the same as that described by Dr. Dalziel.

Dr. Renton also showed the specimens from two cases of subacute appendicitis. The patients had both been boys of 16 or 17 years. One case is described in the *Glasgow Medical*

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Journal for this year, vol. i, p. 299; in the other there had been attacks of pain in the iliac region so severe that the patient had had no reluctance in giving consent to operation. In those cases the result had been perfectly satisfactory. One expected removal of the appendix in such circumstances to give good results, but at the same time it would be a mistake to lose sight of the fact that it was a serious thing to open the abdomen and to perform this operation. The operation should not be undertaken until other means had been tried. He thought that the patient should, in the first instance, have six weeks' rest, with proper diet, proper attention to the bowels, and blistering. He had seen a number of cases in which good results had followed such treatment. But, if recovery did not take place apart from operation, certainly the appendix should then be removed.

Dr. Dalziel had referred to the localisation of the pain as of diagnostic value. Dr. Renton doubted this, and said that it might even be referred to the opposite side of the body.

Dr. Anderson Robertson, who had been in attendance on two of Dr. Dalziel's cases prior to operation, said that he had seen the patient in the first case on three or four occasions during the past two years, on account of slight attacks of colic which had yielded to medicinal treatment, and had not been attended by any pain in the right iliac region. On the Thursday before operation he had been sent for, as there was pain, apparently of the same nature as formerly. The tongue was then furred, the temperature, 101·8°, and the pulse, 110. Next morning temperature was 100°, and that (Friday) evening both temperature and pulse were normal. At 3 A.M. on the Saturday, there developed intense abdominal pain, and in the morning he recognised that there was serious mischief in the right iliac region, and sent for Dr. Dalziel.

In the other case (Case II) Dr. Robertson had seen the patient only on one previous occasion, and then the illness had been due to eating some indigestible food, and had been recovered from after a dose of medicine. He understood that, six months ago, while at Melrose, he had an attack of pain in the right side of the abdomen, which confined him to bed for a week, and was treated by hot applications. On the occasion of the more recent attack, he had seen him first on the Thursday, and diagnosed appendicitis. After a trial of treatment by opium, he had called in Dr. Dalziel, who had operated as described above.

With regard to Dr. Renton's question as to when to open the abdomen, Dr. Robertson referred to a case which he had

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seen on a Sunday for another practitioner, and in which he had at once sent for a surgeon who, however, had refused to operate. Death had taken place on the Tuesday. He had seen similar cases where he believed acute general peritonitis had followed appendicitis, and one of them had recovered. Still, his opinion was that in those cases the abdomen should be opened at once, as the patient's condition was as precarious as sitting on a powder barrel, and one could never tell when an explosion might take place.

Mr. Clark was more and more convinced of the importance of early operation. Dr. Robertson had mentioned a case of recovery, but in it he would fear recurrence. The tendency of the past had been to put off till it was too late. Now the appendix was being dealt with after fewer attacks, and so better results were being obtained. The smaller abdominal opening, as described by Dr. Dalziel, was of great advantage. With Treves' line at the edge of the rectus, one could reach the vermiform appendix and deal with early cases, although it was not sufficient for all the secondary results.

Dr. Dalziel, in reply, referred to the question which had been raised as to when operation should be performed. Though he had not had a very wide experience, he might say that he had never regretted operating early. The case which he had shown that evening was the first in which he had had a fatal result, or, indeed, any anxiety at all. He doubted if the operation was so very serious as it was generally regarded. He had never seen it followed by shock, and he considered it as safe as any other abdominal operation. When one remembered how many exploratory incisions were made into the abdomen without harm resulting, the removal of the appendix would no longer be regarded as one of the more serious operations of surgery.

Dr. Dalziel was interested by what Dr. Renton had said about the records of pulse and temperature in cases of ruptured appendix. He should himself have said that one became anxious when the pulse rose and the temperature fell. Although, when peritonitis set in, high temperatures might be registered, that was not the invariable rule. In his own case the temperature, after operation, had always been subnormal, and yet the patient was not suffering from shock, while his pulse became quicker and quicker, and ultimately numbered 160 in the minute. In cases of septic peritonitis, a low temperature with high pulse rate always suggested to him that the patient would probably die.

Dr. Renton had spoken of pain being referred to the left

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side of the body. That that might occur was suggested by Dr. Boyd's case of transposition of the viscera! Ordinarily the attachment of the vermiform appendix to the cæcum was necessarily on the right side, and it was the rule that pain could be elicited at that point, as described by M'Gurney in his monograph on the subject.

IV.—SPECIMEN OF CONGENITAL OBLITERATION OF THE SMALL INTESTINE.

By Dr. T. K. Dalziel.

N. A., æt. 29 hours, was admitted to the Royal Hospital for Sick Children from the Maternity Hospital, on 27th June, 1894, with a history of vomiting, distension of the abdomen, and no movement of the bowels since birth.

Note on Admission.—The child has a healthy appearance. There is some distension of the abdomen, and frequent vomiting of a greenish mucous material. Rectal examination with the finger reveals a narrowing of the gut at about 1½ inches from the anus—just sufficient to admit the tip of the little finger.

28th June.—The child has had sips of milk throughout the night. Vomiting very troublesome. The vomited matter was at first green, but latterly pale, and was not offensive. The abdomen seems more distended, and some increased resistance is made out in the right flank. Operation being deemed advisable, the child was placed under chloroform, and Dr. Dalziel cut down successively on the sigmoid flexure and caput cæcum coli, only to find these parts collapsed. Dilated and congested coils of small intestine presented at both wounds; from the cæcum the ileum was followed upwards, until there was reached something which felt like a dilated stomach. The wounds were stitched up and the child put to bed. It died the same day.

Post-mortem examination shows that the small intestine ends blindly, a short distance from the cæcum, in a dilated pouch. This latter is situated at the right lower region of the abdomen. The small intestine is congested, but especially the pouch, which contains a pea-soupy material. There is no exudation on the surface. A small portion of the lower end of the ileum (about 6 inches) commencing blindly, is attached to the cæcum. These two blind ends are attached by a fine peritoneal fold, but otherwise do not appear connected, and the lower one is not bound down by mesenteric attachments for 2 or 3 inches at its commencement. This latter small

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portion of ileum is much coiled upon itself, and it, together with the whole large intestine, is undilated, firm, and cord-like, and full of a mucoid material. It was quite evident, from the situation of the defect in the intestine, especially from the extremely thin wall of the dilated pouch and its distension with mucus, that any attempt at anastomosis must have failed. Possibly an artificial anus might have been formed, but the

A. Opposite caput cæcum and vermiform appendix.
B. Opposite portion of ileum, showing free end, and which is attached to cæcum.
C. Opposite dilated pouch, small intestine.
D. Opposite large intestine.

case seemed too unpromising to continue further any operative interference when it became apparent that the whole of the large and lower end of the small intestine were practically obliterated. The child seemed to suffer but little from shock, so usually met with in abdominal section in infants, probably from the small size of the exploratory incisions, and the little disturbance of the abdominal viscera.

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V.—SPECIMEN OF LYMPHO-SARCOMA FROM THE NECK OF A CHILD.

By Dr. T. K. Dalziel.

Dr. Dalziel showed this specimen, and a photograph of the child which had been taken before operation. His account of the case is as follows:—

J. R., æt. 2½ years, admitted 12th February, 1895, with a swelling at right side of neck, which was first noticed about four months previously as about the size of a hen's egg; the tumour has since increased steadily in size. There was no history of inflammation or suppuration about the head. General health has been good. Family history unimportant. The child on admission was found to be fairly well nourished. At the right side of the neck, extending from the mastoid process to the clavicle, and from the posterior margin of the sterno-mastoid to over the middle line in front, was a nodulated mass, like enlarged and adherent lymphatic glands. These, from the absence of any source of septic infection, from the rapid growth and physical characters, were diagnosed as sarcomatous, and, in view of the threatened tracheal obstruction, operation was recommended, and was performed on 21st February. An incision, extending from the mastoid process to the inner end of the clavicle, joined by an anterior transverse incision 1½ inches in length, enabled the tumour to be fairly well exposed. Over the tumour stretched the sterno-mastoid, which was adherent, and the middle third of it removed. The tumour was fairly free in front, and at its lower extremity, which projected into the chest behind the clavicle.

On its posterior and inner parts, however, it was firmly adherent to the deep muscles of the neck, and to the jugular vein, 2 inches of which was ligatured and removed; the carotid artery being dislocated from the tumour without difficulty, though, in doing so, irritation of the pneumogastric nerve frequently gave rise to anxiety from arrest of the action of the heart. The child bore the operation well, and exhibited little shock. A drainage-tube was placed in the dependant part of the wound—in the pouch behind the clavicle—for twenty-four hours, and the wound was stitched and dressed in the usual manner. The wound subsequently healed well, and the child was dismissed on 6th March—fifteen days after operation—there being some thickening over the mastoid process.

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The tumour weighed one pound, and measured 3½ inches by 2¾, and proved to be a lympho-sarcoma.

The child was last seen on 14th May in good health, with some thickening over the mastoid process still present, but decreasing.

Mr. Clark asked if there were any reason to suspect involvement of the mediastinal glands.

Dr. Dalziel replied that there was not, in the meantime.

REVIEWS.

Leprosy, in its Clinical and Pathological Aspects. By Dr. G. Armauer Hansen and Dr. Carl Looft. Translated by Norman Walker, M.D. With numerous Photographs and Coloured Plates. Bristol: John Wright & Co. 1895.

During a recent visit to Norway, we had the great pleasure of receiving a clinical and pathological demonstration on leprosy in the Leper Asylum at Bergen, from Dr. Armauer Hansen, Inspector-General of Leprosy in that country, and one of the greatest of living authorities on this dreadful disease. The views enunciated by Dr. Hansen at that demonstration were, in brief, precisely those which are now made known to English readers in the present translation of Hansen and Looft's treatise. We may here say that the treatise is, in our opinion, in all respects excellent. It is concise and clear throughout, not cumbered with masses of detail, and the reader feels on closing the book that he has had brought before him, in the clearest of outline, all the principal phenomena of the disease. To accomplish this in the space of the volume before us implies not only that the authors have a clear conception, based on long and wide experience, of what is, and what is not, leprosy, but also that they have the literary gift which enables them clearly to convey their ideas to others. The translator also has done his work well.

Leprosy is divided into two varieties—viz., nodular leprosy and maculo-anæsthetic leprosy. A full clinical and pathological account is given of each variety. Notwithstanding some points of similarity between tuberculosis and leprosy, it is perfectly clear to Hansen and Looft that, in every respect, they are perfectly distinct and independent diseases, although often, as the tables in the appendix clearly show, combined in

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the same patient. In this regard it is interesting to know that Koch's tuberculin produces a pronounced general and local reaction in leprosy, without, however, any benefit, but rather the reverse, to the patient. It is remarkable also that the authors, having examined microscopically thousands of specimens of leprous tissues, have never seen characteristic giant cells or areas of caseation in them. This certainly is a striking pathological difference from tubercle.

With regard to the position of the lepra bacilli, Hansen believes that they exist in the interior of the corpuscles. In this he differs from Unna of Hamburg, who believes that they inhabit the lymphatic channels. Some years ago we had the opportunity of carefully examining a leprous nodule from a patient in Glasgow, and we convinced ourselves then that the bacilli were very largely situated in the interior of the fixed corpuscles of the tissue.[1] The maculated condition of the skin in maculo-anæsthetic leprosy is a bacillary condition, not a mere tropho-neurosis, as many of us here have been inclined to believe. The longer this form of the disease lasts, the more the neuritis predominates, and the less pronounced the maculated condition of the skin becomes.

Perhaps the most interesting chapters of the book are those devoted to etiology and treatment. For the doctrines here promulgated, we cannot but suppose that Dr. Hansen, as being the senior author, is mainly responsible. In every line of these chapters the striking individuality and the transparent honesty of Hansen are apparent. When he has formed a clear and definite opinion on a subject he states it clearly and boldly; when he can form no opinion, or when he believes that we can know nothing of the particular matter under discussion, he has no hesitation in plainly avowing his ignorance. Thus, with regard to heredity, he is absolutely convinced that leprosy is not a hereditary disease. A thorough-going, up-to-date believer in modern bacteriological pathology, he is clear in his own mind that the bacilli and nothing but the bacilli are responsible for the causation of leprosy. The logical conclusion of such a position is the non-hereditary nature of the disease, and Hansen accepts the conclusion without hesitation. "Baumgarten's latent germinative infection," and all other theories which have been constructed in the endeavour to explain some of the puzzles of pathological heredity, are swept aside without mercy. While we cannot help admiring the intense conviction of Hansen that his view is right, we feel that perhaps his statements are a little too

[1] *British Medical Journal*, 1885, vol. ii, p. 96.

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absolute. In his application of the word heredity, we think his view is too limited. He seems to take no cognisance of the position that a particular type or constitution of tissue may be conveyed by heredity, without which the leprosy bacillus could not act. For a clear exposition of modern bacteriological views on pathological heredity, we commend our readers to a careful study of the chapter on etiology in this book.

With regard to treatment, nothing avails except isolation. As the result of isolation, commenced in 1856 and carried out since then at a total cost of about 7,000,000 krones (a krone is rather more than 1s. 1d.), the number of cases of leprosy in Norway has fallen from 2,833 to about 700 this year, and Hansen calculates that by 1920 there should be no leprosy in Norway. May his prediction be fulfilled!

The photographs and coloured illustrations in the volume are excellent. That the histological illustrations are true to nature we can vouch for, from having had the opportunity of examining some of the original preparations in Bergen.

The Climates and Baths of Great Britain, being the Report of a Committee of the Royal Medical and Chirurgical Society of London. W. M. ORD, M.D., Chairman; A. E. GARROD, M.D., Hon. Secretary. Vol. I: "The Climates of the South of England and the Chief Medicinal Springs of Great Britain." Contributors—ROBERT BARNES, M.D.; J. MITCHELL BRUCE, M.D.; W. H. DICKENSON, M.D.; W. EWART, M.D.; A. E. GARROD, M.D.; W. LAZARUS-BARLOW, M.D.; MALCOLM MORRIS, F.R.C.S.E.; W. M. ORD, M.D.; F. PENROSE, M.D.; FRED. ROBERTS, M.D.; E. SYMES THOMPSON, M.D. London: Macmillan & Co. 1895.

CLIMATOLOGY and balneology are subjects of the greatest interest and importance to practising physicians and surgeons, and the publication of authoritative climatological works must ever be of the greatest service to the medical profession. It may well be that in former times a study of climate was of special interest only to those members of the profession whose lot it was to advise the wealthy and leisured classes of society; but, with our ever increasing facilities for travel, and the comparatively small cost at which we may now visit all the countries of the earth, climatology has come to be of direct practical importance to the whole medical profession, and to all sorts and conditions of men. It was a good idea, then,

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which, at a meeting of the Council of the Royal Medical and Chirurgical Society on 14th May, 1889, led Dr. Barnes to move, and Dr. Ord to second, the following motion :—"That a Scientific Committee be appointed for the purpose of investigating questions of importance in reference to the climatology and balneology of Great Britain and Ireland, and to report hereon to the Council from time to time, with power to add to their numbers." The Council of the Society manifested a laudable desire to promote the welfare of the profession by adopting this motion, and the appearance of the present volume proves that it displayed great wisdom in the selection of the members of the Committee. We have printed above the names of the gentlemen contributing to this, the first volume, of the Committee's report, and those who are interested will find the names of the whole Committee in the preface of the book. The names of the contributors are, we should think, a sufficient guarantee that the work would be well done, and, having looked through the volume and read carefully some of the articles, we can say that it has been. The Committee has pursued three lines of investigation—first, it has received information (in reply to circular letters) from practitioners in the localities concerned; second, members have made personal investigations of various localities; and third, reliable statistics of the different health resorts have been carefully analysed. The records of the Meteorological Office and of the Royal Meteorological Society have been laid under contribution, and special attention has been given to the relative prevalence of health and disease, and to the influence of the climate on health and disease, in the several districts under examination. The result of all this work has been the compilation of a mass of reliable information which cannot fail to be of the greatest service, and which has the further advantage that it has been gathered together and carefully weighed by a body of thoroughly competent, and quite impartial, investigators. It is needless to deal with the different articles in detail, but we can, with every confidence, refer our readers in search of reliable information about the great health resorts of the South of England and the baths of Great Britain to this volume.

One remark, in reference to the relationship of phthisis to intermarriage in the Channel Islands (p. 110), struck us as being worthy of note. It is said that "phthisis does not seem to be affected by the very general custom of intermarriage," which, owing to the law of "gavel-kind," is very common amongst the natives. We would have thought that the reverse would have been the case.

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Strathpeffer and Moffat are the only Scottish health resorts discussed in the volume. The article on Moffat occupies eighteen lines (five of them containing less than four words), and eight paragraphs; and we would have thought it scarcely worth while to notify that this exhaustive article is from the pen of Mr. Malcolm Morris. The motion adopted by the Council specially mentions Ireland. On the title-page of the volume the name of Ireland does not occur. Whether this is to be regarded as another injustice to Ireland we must leave the critics in the Emerald Isle to say.

A very full alphabetical index adds greatly to the value of the book, which is in every way worthy of the great Society from which it has emanated.

Deformities of the Human Foot, with their Treatment. By W. J. WALSHAM, M.B., C.M. Aberd., F.R.C.S. Eng., and WILLIAM KENT HUGHES, M.B. Lond., M.B. Melb., M.R.C.S. Eng., L.R.C.P. Lond. London: Baillière, Tindall & Cox. 1895.

As stated in the preface, the original intention of the authors of this work was to write a book on orthopædic surgery, giving the results of Mr. Walsham's thirteen years' experience in the Orthopædic Department at St. Bartholomew's Hospital. The original intention was departed from, and the subject of deformities alone published in the present form.

The most striking feature about the book is the profusion and excellence of the illustrations. Of these, more than half (176) are reproductions of photographs of the deformities taken in the Department. While some of these might have been more distinct, they are generally very good, and bring out the points which it is desired to show, and have the advantage over woodcuts that they are exact representations of the deformities.

The first chapter treats of the anatomy and mechanism of the normal foot, and is illustrated by a series of photographs enabling the reader to refresh his memory on the normal anatomy. The intimate structure of the bones of the tarsus is very carefully described, and the arrangement of the trabeculæ of the cancellous bone is shown in numerous photographic representations of sections of the bones, the striæ thus shown indicating the lines along which the weight of the body is transmitted.

More than a third of the book is concerned with the

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description and treatment of talipes varus, or equino-varus as it is usually called. The description of the pathological anatomy of the condition, principally from a preparation in St. Bartholomew's Museum, is very instructive as showing the nature of the deformity of the individual bones; and the photographs enable the reader to follow the description with ease. On the subject of treatment of talipes varus, it is advised for all, except the slightest cases, to operate in two steps, overcoming the varus first, either by manipulation or mechanical or operative treatment; and after that is cured, overcoming the equinus portion of the deformity by division of the tendo Achillis. The various methods of mechanical treatment are discussed and illustrated, but plaster of Paris applied immediately after the complete rectification of the deformity is advocated, followed by a boot to prevent relapse. In severe cases the cause of the resistance to reduction of the deformity is traced to a downward and inward deflexion of the neck of the astragalus, and, therefore, division of the astragalo-scaphoid and calcaneo-spaphoid ligaments is not advised, but some form of operation on the bones. The operation on the bones which is advised is removal of a double wedge from the external and upper aspect of the tarsus, which is performed by the authors by means of a chain-saw.

The other forms of talipes receive also careful consideration, their pathological anatomy being carefully described and illustrated.

A considerable section of the book is devoted to the consideration of flat-foot. A valuable part of this is the illustrated description of the skeleton of an advanced degree of flat-foot. The treatment recommended in cases where the patient can himself temporarily restore the arch, or where the surgeon can do so without giving pain, is rest, exercise, and boots adapted to combat the deformity. Where the arch can only be restored under chloroform, wrenching into position and retention of the restored arch in plaster of Paris is recommended. In the worst degree, where the arch cannot be restored by force under chloroform, palliative treatment, or Ogston's operation, or supra-malleolar osteotomy are recommended, but they have only performed the two latter operations once, and do not say much in their favour. They state that frequently patients have been brought to the theatre to have an operation on the bones performed, but, that once under chloroform, the arch was easily restored by wrenching. Considering, however, the deformity which exists

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in the bones in all fairly advanced cases, it is difficult to see how such a method of treatment can be followed by permanent cure. He figures one case thus treated after a year. The case is said to have been a severe one with convexity of the sole, and the arch is certainly seen in the photograph much improved, but it would have been useful had statistics been given of the permanence of the cure by this means in a number of cases some time after active treatment had been stopped.

The book is unquestionably a valuable addition to the literature of the subject, and contains a very considerable amount of original observation, and is certainly the best illustrated book which we have on the subject. The great care which is given to the description of the pathological anatomy of the various deformities is of great value, as suggesting rational modes of operating.

The Value of Electrical Treatment. By JULIUS ALTHAUS, M.D., M.R.C.P., M.R.I., Consulting Physician to the Hospital for Epilepsy and Paralysis, Regent's Park. London: Longmans & Co. 1895.

THIS little book of some 96 pages is one we have much pleasure in recommending to our readers.

One so often hears electricity ordered in nervous affections without any details as to its use; and it is so often applied in the same indefinite manner that evidently considerable ignorance exists as to the electrical treatment of disease. This book by Dr. Althaus, therefore, comes most opportunely, and supplies to us, in concise yet pleasing form, information much required.

The author begins with an account of the various kinds of electricity, telling the best batteries to use in each case. He then describes the action of electricity on the tissues, and he tells us what principles we must go on in applying electricity in disease. Useful details are given as to the electrodes, their areas and points of application. We are told the strength of currents to use, and for how long they should act.

The rest of the book deals with the use of electricity in various diseases considered separately. By way of illustration, some interesting cases are cited, and the successful treatment in general debility, and in some other more definite nervous affections, is very encouraging.

The book, of course, is by no means exhaustive, and, indeed,

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the chief fault we have to find with it is that it is too short; but, on the other hand, it is well written and well arranged, and will be read, we are sure, by many who would not attempt a book of larger size.

Myxœdema and the Thyroid Gland. By JOHN D. GIMLETTE, M.R.C.S. Eng., L.R.C.P. Lond. London: J. & A. Churchill. 1895.

WRITTEN originally in Portugese and presented to the Medical School of Lisbon as an inaugural thesis, this synopsis of 120 pages is now published in amplified form in English.

Those specially interested in the subjects dealt with will not find anything that is new, seeing that the volume simply purports to be a convenient epitome of our knowledge regarding myxœdema and the thyroid gland, and as such it can be recommended.

We regret that the compiler has thought it unnecessary to provide a bibliographical appendix, as all digests of this class are, by such an addition, rendered of more permanent value.

A Course of Elementary Practical Bacteriology, including Bacteriological Analysis and Chemistry. By A. A. KANTHACK, M.D., M.R.C.P., and J. H. DRYSDALE, M.B., M.R.C.P. London: Macmillan & Co. 1895.

THIS, the most recent of Messrs. Macmillan & Co.'s well known "Manuals for Students," will be welcomed by many who desire simple and definite systematic instruction in the methods of bacteriological investigation. As a laboratory handbook, we believe it will prove of much value, and will be specially useful to candidates for the Diploma of Public Health, seeing that, in the preparation of the volume, their requirements have been borne in mind.

The course of instruction, which is that followed in St. Bartholomew's Hospital, is modelled on that of the Pathological Laboratory of the University of Cambridge, and the methods employed those in use in similar laboratories at home and abroad.

The work is divided into three parts, containing in all thirty-eight lessons. Part I, consisting of twelve lessons, deals with the elements of general bacteriology, and includes instruction in the various methods of inoculation and examination of the more important pathogenic microbes. Part II, with

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sixteen lessons on bacteriological analysis, affords directions for sterilisation of apparatus, for the preparation of nutrient media, for the examination of air, water, soils, food, milk, for the testing of antiseptics and disinfectants, and so forth. Part III "forms, so to speak, an appendix to the two previous parts, and comprises an introduction to bacteriological chemistry for those who are desirous of devoting some of their time to advanced investigation and research work." The exercises given in this section include the preparation of the metabolic products of microbes, the separation and examination of proteïnes, peptones, albumoses, &c. Uschinsky's method for the preparation of diphtheria toxine forms, for example, one day's work, while, to the examination of ferments and enzymes, two lessons are devoted, one to the investigation of ptomaïnes.

The general plan of the work is excellent; the directions always lucid and to the point, and workers in this field will find many useful and practical recommendations — or what are commonly known as laboratory "tips"—which they will look in vain for in the pages of an ordinary text-book on bacteriology.

Transactions of the Pathological Society of London. Vol. XLV. London: Smith, Elder & Co. 1894.

For the last four or five years it has been noticeable that the annual volume published by this excellent Society has, in matter of size, been rather on the decrease, and although one is unable to detect in the present issue, or immediately preceding issues, any corresponding deterioration in the nature or importance of the communications contained therein, still, our readers will be pleased to learn that, owing to a modification of the existing regulations, there is every probability that the value of the *Transactions* will be in coming years much enhanced. How this is to be brought about is best gathered from the following statement embodied in the annual report of the Council:—"In view of the disadvantage in which the Society is placed in respect to communications embodying results of recent scientific research, owing to the fact that, according to present regulations, no communication previously published in detail is admissible to the *Transactions*, and no communication can appear in the *Transactions* until several months after the conclusion of the session, your Council has for some time had under consideration means by which this difficulty might be met. The Council has now resolved that

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authors of papers, which have been brought before the Society, shall be permitted to publish them forthwith in the *Journal of Pathology and Bacteriology;* and arrangements have been entered into with the proprietors of this *Journal* to facilitate the early publication of scientific communications by this means."

It is quite unnecessary even to mention the titles of the numerous and exceedingly interesting contributions to the volume before us, seeing that notices of all the articles have already appeared in our weekly journals. We might, however, be allowed to draw attention to a series of papers by various observers, dealing with the pathology of rodent ulcer, and embodying the views—strangely at variance at times one with another—held by those who have specially investigated this difficult and hence interesting subject.

King's College Hospital Reports. Edited by NESTOR TIRARD, M.D., W. WATSON CHEYNE, F.R.C.S., JOHN PHILLIPS, M.D., W. D. HALLIBURTON, M.D. Vol. I (1st October, 1893, to 30th September, 1894). London: Adlard & Son. 1895.

WE have often wondered why King's College Hospital has not long ago, like its sister hospitals in London, issued annually a volume of reports, seeing that it has numbered on its staff many whose names are favourably known in various departments of medicine, whose daily work in the wards, in the dispensaries, and in the *post-mortem* room would have been well worthy of record. We thus cordially welcome this first volume, and trust it may be the beginning of an uninterrupted series.

The aim of the editors is not only to furnish a record of interesting cases and reports from the various scientific departments of the hospital, "but also to give an indication of what has been done, and is being done, by former students." The volume, thus, although interesting and valuable to all, will be doubly so in the eyes of old "King's" men.

It opens, as is customary with records of this nature, with the first part of a historical sketch of the College and Hospital by the Dean of the Faculty of Medicine. Succeeding this is a series of articles by various members of the staff. We can do no more than mention the titles of these papers, which are—"The Curable Stage of some Incurable Maladies," by Lionel S. Beale; "The Abstraction of Blood, Clinically Considered," by Alfred B. Duffin; "A Case of Functional

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Albuminuria," by Nestor Tirard; "Psychological Medicine in Relation to the Medical Practitioner," by Ernest W. White; "On Sneezing," by Greville Macdonald; "On the Principle of Selection as Applied to the Administration of Anæsthetics," by J. Frederick W. Silk; "On the Artificial Maturation of Immature Senile Cataract by Trituration," by Malcolm M. M'Hardy; "On Some Cases of Pelvic Suppuration in the Female," by John Phillips; "The Treatment of Gonorrhœa and Gleet by Means of the Urethroscope," by F. F. Burghard; "Bursitis," by G. L. Cheatle; and "The Value of the Discoveries of Sir Charles Bell," by W. A. Turner.

Classified summaries of the medical and surgical cases admitted during the year, with notes on those of particular interest, follow. We may mention in passing that the number of medical cases admitted was 725, and that of these 108 died —surely an uncommonly high mortality; while of the 1,066 surgical cases admitted, in 44 death resulted. In this connection, we would specially draw attention to the favourable results obtained by Mr. Watson Cheyne in his interesting series of cases.

There are also included short reports from the various special departments of the hospital and from the laboratories, and, what is an interesting feature of the volume, a list of former students, now engaged in hospital work or in the Services, with the titles of the papers—sometimes given in abstract—contributed by them to medical literature during the year.

There are a few inaccuracies, owing chiefly to printer's errors. One of these is perhaps more amusing than serious, and occurs in the returns of the obstetrical department (p. 251), where a woman is credited with having been treated for "*post-mortem* hæmorrhage" with a successful result. On the whole, however, the printers and proof-readers, like the editors, may be congratulated on having produced a well-printed, well-planned, comely, and interesting volume.

Verhandlungen der Berliner Medicinischen Gesellschaft, aus dem Gesellschaftsjahre 1894. Herausgegeben von dem Vorstande der Gesellschaft. Band XXV. Berlin, 1895.

THE present volume resembles in many respects its immediate predecessors, and these have always been most favourably noticed in our columns. It contains records of many cases of much interest, and reports of several valuable discussions.

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Amongst the latter we would mention a very protracted discussion on a paper by Weyl on the influence which the improved hygienic conditions of Berlin have had on the health of the community, and others dealing with such topics as ether narcosis, pelvic suppuration in women, intra-uterine treatment, &c. More particularly would we draw attention to the reports of the very animated and long-continued debates on the antitoxine treatment of diphtheria which followed on the reading of Hansemann's much quoted and much criticised paper, seeing that these probably constitute the most important items in this year's issue. From among the many other noteworthy articles in almost every branch of medicine and surgery, we can only select a very few which are of more than common interest. For example, two short illustrated papers—one by Virchow on myositis progressiva ossificans, the other by F. Lehmann on tuberculosis of the placenta—deserve prominence, while the description of a case of myasthenia gravis pseudo-paralytica, by Jolly, and the account by Ewald of a case of myxœdema, with remarks on the employment of thyroid preparations in this and other diseases, will be read with advantage.

As the *Transactions* have now reached their twenty-fifth volume, and as none of the volumes are supplied with an index, we would suggest to the publishing committee the advisability of issuing a general alphabetical index, seeing that only by this means can the rich store of material be placed within ready access of all.

The Technique of Post-Mortem Examination. By LUDVIG HEKTŒN, M.D. Chicago: The W. T. Keener Co. 1894.

THE works of Virchow, Orth, Nauwerck, and others, and certain chapters contained in most of our text-books on pathology, furnish complete and reliable directions for the performance of *post-mortem* examinations. For the average practising physician or surgeon who may himself desire, or who may be suddenly called upon—for example in a medico-legal case—to act the part of pathologist, these directions may possibly fall short of his requirements either from the multiplicity of detail or the reverse. To such, rather than to those daily engaged in *post-mortem* work, this little handbook will prove of signal service, as the subject is dealt with in a common-sense manner, as the most generally approved methods are adopted, and the most generally serviceable instruments employed.

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After some general considerations on the necessity of a systematic plan of procedure, and a warrantable reflection on the wanton waste in many hospitals and public institutions, of much valuable pathological material, the writer proceeds to discuss the *post-mortem* room and its equipment. The list of instruments considered necessary is not over-extensive. The key-hole saw, amongst special instruments, is recommended for the removal of portions of the base of the skull, while an efficient looking saw with a rounded blade is figured for sawing the vertebral laminæ. Again, an enterotome, in which one of the blades ends in a smooth rounded and blunted extremity, is wisely substituted for the more commonly used hooked gut scissors.

The author then deals with the *post-mortem* record, which should be able to be characterised as a concise, clear, and thorough description, which must be self-interpreting and unembellished with unnecessary deductions, and he gives a sample of the manner in which such a record should be framed for the coroner. He then makes a remark to the effect that "in hospitals the ward history, or a summary thereof, must accompany the patient (*sic*) to the dead-house," and to the kindly attention of hospital physicians and surgeons we would courteously present, in the interests of science, the above short quotation, in the hope that what would appear sometimes to be regarded as a superfluity, or even as a gratuity, may be looked upon rather more in the light of an absolute necessity, as essential to the pathologist as a bistoury, or as a stethoscope to his clinical colleagues.

Amongst items not always included in such works are short chapters on *post-mortem* dissection wounds and their treatment, the examination of cases of suspected poisoning, the examination of newly-born children, and what is very often omitted, short directions as to the restoration of the body after the completion of the examination. Tables, chiefly borrowed from Vierordt or Nauwerck, of the average weight and dimensions of the healthy adult organs, and of the length of the fœtus at each month of gestation, will be found to hand for reference.

The illustrations, forty-one in number, are in part borrowed, in part original. A few of the latter are reproduced from photographs which can only be regarded as sorry productions. They not only in several instances (Figs. 22, 23) violate the laws of photography, but they also are in some cases quite unnecessary (Fig. 2) or confusing.

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The Etiology of Osseous Deformities of the Head, Face, Jaws, and Teeth. By EUGENE S. TALBOT, M.D., D.D.S. Third Edition. Revised and Enlarged. With 461 Illustrations, 422 of which are Original. Chicago: The W. T. Keener Co. 1894.

THIS work, as far as we are aware, is not widely read in Great Britain, but it has attained a popularity in America sufficient to necessitate the publication of an enlarged revised third edition. The result is the appearance of a volume of 500 large pages, with about as many illustrations elucidating the text. The earlier editions were written to counteract the theory that irregularities of the teeth and jaws were the result of local, not constitutional, conditions, and the increasing volume of evidence against this theory has forced the author to extend the scope of his original inquiry into departments of oral and nasal medicine, and surgery of the eye, ear, and face, so intimately related to dental medicine through the causation originally assigned for irregularities of the teeth and jaws. The alleged causative factors in the case of the nose and mouth were themselves often found to be of constitutional origin. The scope of the researches presented in this edition, therefore, while seemingly extended, are practically confined to the limits of the original inquiry.

For the purpose of indicating the manner in which the author deals with the question of "the etiology of osseous deformities of the head, face, jaws, and teeth," the following quotations are given:—"The causation of deformities of the head, face, jaws, and teeth has not received the attention from scientists which its importance demands. Of late these deformities have been traced to climatic changes, race intermixture, heredity and social environment. The unstable conditions of this last give rise to a tendency to the development of these conditions. The teeth, jaws, and face have been variable factors in evolution, and hence are most readily affected by the forces tending to degeneracy. Such conditions are easily affected by the factors arising out of the 'struggle for existence.'"

"The law of the 'survival of the fittest' affects not only the entire organism, but also the parts themselves. Some one part attains undue development. Such a product of degeneracy once obtained might, under proper conditions, remain, while the rest of the body returned to the normal type. The frequency with which these stigmata of degeneracy are found in otherwise sound systems indicates that the law of atavism

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tends to eradicate as well as to cause them. Given these deformities in a subject of normal mental health, they simply indicate that a more or less remote ancestor had been subject to the influence of the factors producing degeneracy, but that in the main the offspring were regaining the normal standard.

"The lesson to be drawn from these stigmata is the hygienic one that, given the tendency to degeneracy shown in these deformities, the progress of that person under the factors named will tend more toward disease than that of the person in whom they are absent. The frequency of these deformities should hence have early created the suspicion that they were of constitutional and not local origin."

We believe that the author would find more readers in this country were he to have contented himself with condensing instead of enlarging his work. At the same time we cannot but admire his painstaking labour in bringing forward, in support of his theory, such a mass of evidence from almost every conceivable source, and we trust that the encyclopædic dimensions of the work will not deter dentists and surgeons from looking into its pages.

A Monograph on Diseases of the Breast: their Pathology and Treatment. With Special Reference to Cancer. By W. ROGER WILLIAMS, F.R.C.S. With 76 Figures. London: John Ball & Sons. 1894.

SINCE the publication in 1854 of Velpeau's classical work, in which the labours of Sir Astley Cooper, Nélaton, Bérard, Birkett, and others are reviewed, and, within comparatively recent times, of Billroth's excellent treatise in the *Deutsche Chirurgie*, no exhaustive and authoritative work, solely confined to diseases of the breast, has appeared. The works of Labbe and Coyne, Gross, Nunn, Bryant, and a host of others, have each and all much that is valuable, but their scope is limited. Seeing that within the last few years such distinct advances have been made in our knowledge of mammary affections, both as regards pathology and treatment, the appearance at the present date of a thoroughly comprehensive monograph is as welcome as it is well-timed. The gathering together, from various sources, of the many recent contributions to this interesting realm of surgical pathology, has been undertaken by one who is eminently qualified for the task, and we venture to say that no one will read the results of Mr. Roger Williams's labours without being struck with his painstaking

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industry and discriminating judgment. Mr. Williams is already known to the profession as an able statistician, and the present work not only serves to strengthen and confirm his position in this department of scientific investigation, but also to display, on the part of its author, faculties of sound reasoning and observation in matters pathological. It is more from the pathological than from the surgical side that we view this work.

Possibly on the assumption that "good wine needs no bush," the volume is without a preface. Its first four chapters deal with the ontogeny and phylogeny of the breast, with various anomalies of secretion, with excessive and defective development, and allied subjects. Of particular interest are the author's remarks on "mammæ erraticæ" and the development of neoplasms from supernumerary mammary structures. In 50 cases of fibro-adenoma, the author was able to trace in 7 an origin from supernumerary mammary structures, and in 132 cases of cancer, 13 cases with a similar origin, from structures quite outside the normal mamma. The various forms of hypertrophy are then fully detailed, and are followed by a chapter on histology and neoplastic pathogeny. The subject of the varieties of mammary neoplasms and their relative frequency is then discussed with an authority based on very large and carefully compiled statistics, and the way is thus opened up for the consideration of cancer, which is a masterly piece of work. To this subject no fewer than 284 pages—more than half of the volume—are devoted. Two leading types or divisions of cancer are described, according as the disease originates from the acini or from the ducts of the gland. To the first of these, the *acinous*, which includes scirrhous or alveolar cancers, the great majority (94 per cent) of mammary cancers belong, while under the category of *tubular* cancers are included the true duct-cancers. Under this heading the author does much to clear up the obscurity which has for long enveloped the so-called villous duct cancers. He points out that, under the term villous cancer, at least two perfectly distinct kinds of neoplasm are included—the non-malignant papilloma and the malignant tubular cancer or true duct cancer. Those exceptional cases of villous papilloma, in which a recurrence has taken place, are to be regarded as probably due to incomplete ablation of the primary disease. By this simple division of cancers, the terms encephaloid and medullary, as applied to cancers of the breast, can be dispensed with, and wisely so, seeing that most of the tumours so designated find their proper place among the sarcomata. To

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the subject of cancer of the male breast, which in most treatises receives but scanty notice, an entire chapter is devoted, in which the results of the examination of 100 cases collected by the author are detailed. The difficult question of the etiology of cancer is manfully faced, the various predisposing causes thoroughly and carefully investigated, and after a fair statement and careful examination of the facts for and against the microbic theory of cancer, the author arrives at the conclusion that "the microbe of cancer has not yet been discovered, because in all probability it does not exist."

The other tumours of the breast are treated with a fulness proportionate to their frequency of occurrence and pathological interest. Ample justice is done to the subject of sarcoma, under which heading are grouped the adeno-sarcoma, the exceedingly rare pure sarcoma, the equally rare so-called alveolar sarcoma, the myxoma and keloid, and its allies. The simple tumours, both solid and cystic, are handled in the same skilful manner, the writer emphasising his very warrantable belief that probably all the recorded cases of "*true* adenoma" —*i.e.*, of tumours structurally exactly like a segment of the breast itself, only not united to the gland by its main duct, are nothing more or less than overgrown supernumerary mammary sequestrations.

Inflammation, suppuration, tuberculosis, and syphilis form the text of the more important concluding chapters of the work.

The illustrations, which are in most cases borrowed, and in all acknowledged, are judiciously selected, and might with advantage be increased in number.

In conclusion, we have only to express to the author the great pleasure which the perusal of his volume has afforded us, and to congratulate him on having produced what must be regarded as the leading monograph on the subject.

Leçons de Chirurgie. Par Le Dr. Félix Lejars, Professeur Agrégé a la Faculté de Médicine de Paris, Chirurgien des Hôpitaux. Paris: G. Masson. 1895.

Dr. Lejars' forty-seven clinical lectures constitute a volume of 620 pages, and deal with a large number of surgical topics. While they contain nothing original, they afford instructive and pleasant reading. In any language the lecture style of composition readily lends itself to whatever powers of graphic description and illustration the writer may possess. In the French this is, perhaps, peculiarly so, and in the volume before

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us the author's well-defined ideas are forcibly and clearly presented.

The lectures are grouped in six sections—viz., General Surgical Pathology; Surgery of the Limbs, of the Head and Neck, of the Alimentary Canal, and of the Genito-urinary Organs; and Operative Gynæcology.

Amongst the most interesting of the lectures on general surgery are a highly suggestive one on the pulse in surgery, and a lecture on the physiological conicity of stumps.

In the section on the surgery of the limbs, Dr. Lejars advocates suture of the bone in fracture of the clavicle and amputation by a posterior flap at the knee-joint.

The final third of the volume is occupied by lectures on genito-urinary and gynæcological surgery, which embrace a large number of affections and operations.

The volume should command a wider circle of readers than that merely of Professor Lejars' students.

A Manual of Ambulance. By J. SCOTT RIDDELL, M.B., C.M. London: Charles Griffin & Co.

EVERYTHING that an ambulance student, military or civilian, can reasonably be expected to know, is discussed in these pages with a thoroughness that leaves little to be desired. The author's suggestions are always sensible and practical, and his style clear and simple. An outstanding feature of the book is the number and excellence of the illustrations. These must prove of immense assistance to the student.

The Physiology of Death from Traumatic Fever: A Study in Abdominal Surgery. By JOHN D. MALCOLM, M.B., C.M., F.R.C.S. Edin. London: J. & A. Churchill. 1893.

OUR readers will doubtless be pleased to have in convenient form this scholarly essay by Mr. Malcolm, long abstracts of which have already appeared in the *Lancet*, 25th February and 4th and 11th March, 1893, as well as in the sixteenth volume of the *Transactions of the Medical Society of London.*

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

NERVOUS DISEASES AND INSANITY.

By Dr. R. S. STEWART.

Chlorobrom as a Hypnotic. By Wade (*American Journal of Insanity*, April, 1885).—This drug, which is a mixture of chloralamide and potassium bromide, was administered to 16 patients, and was found valuable in cases of simple melancholia, but failed to act in active melancholia. In acute mania it took longer to act, but was effectual in producing sleep, which was as long and refreshing as that produced by other hypnotics. Uniformly good results followed its use in cases of dementia with insomnia. The dose given was 30 grs. of each of the component drugs, and the time required to induce sleep was somewhat longer than in the case of paraldehyde or sulphonal, being about three-quarters of an hour in cases of mania, and one hour in melancholia. No bad after-effects were recorded.

The Blood in the Insane. By Burton (*American Journal of Insanity*, April, 1895).—From an examination of 14 cases, with particular reference to the leucocytes, it is concluded that in cases of senile dementia there is, as a rule, an increase in these elements; while in general paralysis there is a marked decrease, and that in cases with a tendency to maniacal excitement there is a great increase.

Introduction of an Artificial Testicle, and Relief of Morbid Mental State in a Mono-Cryptorchid. By Hermance (*American Journal of Insanity*, April, 1895).—Two similar cases have been previously recorded. A young man of 21, whose left testicle had never descended, and who was urgently desirous of getting married, became morbidly depressed on account of his deformity, and was developing the fixed idea that he could not beget children with only one testicle. The introduction of a silver testicle was followed by complete contentment of mind, and satisfaction as to his virility.

Voluminous Sarcoma of the Brain commencing in the White Substance. By Gallavielle and Villard (*Archives de Neurologie*, July, 1895).—The points of interest of this case refer to its histological nature, seat, and size, and the modifications brought about by its presence on the brain and cranial cavity. Microscopic examination showed that it was a pure sarcoma, without any admixture of nervous substance. Most of the described cases occurred in infants or adolescents, the age (32 years) at which this one occurred being unusually advanced. The exclusive localisation of tumours in the white substance, as in this case, is of rare occurrence, and its position in the frontal region accounted for the early psychical troubles noted, and the later appearance first of hemiparesis and afterwards of hemiplegia. The most remarkable feature is the enormous volume of the growth, which attained the dimensions of a turkey's egg, without for a long period producing other than relatively slight symptoms. The presence of the tumour produced a remarkable deformity of the affected hemisphere of a double character, an increase of the frontal lobe so great that the fissure of Rolando was pushed backward so as to be nearer the occipital than the frontal extremity of the hemisphere, and a flattening and enlargement of the convolutions of the lobe, resulting in an apparent increase of size of the convolutions, and diminished

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depth and sinuosity of the fissures. Another consequence of the presence of the tumour was an enlargement of the cranial cavity, which took place at the expense of the thickness of the cranial bones, which were thin and diaphanous. Finally, the tumour was surrounded by a very distinct zone of softening, measuring at points several millimetres in thickness, but not so pronounced as to enable the growth to be enucleated. The origin of this is, in the opinion of the observers, to be found in anischæmic softening produced by an obliterating arteritis.

Chronic Renal Disease and General Paralysis. By Bristowe (*Journal of Mental Science*, July, 1895).—It is maintained that chronic renal disease is very frequent in ordinary insanity, but is far more common, is in fact the general rule, in general paralysis. The form of renal disease is not always interstitial nephritis. These two diseases are regarded as of toxic origin, and as manifestations of arterio-capillary fibrosis.

General Paralysis in a Girl Aged Nine and Three-Quarter Years. By Dunn (*Journal of Mental Science*, July, 1895).—In this case symptoms of intellectual enfeeblement, with slight choreic movements, supervened a little over 9 years of age after an alleged fall. Afterwards she became restless and violent, had sudden fits of crying, and her speech began to fail. The case was characterised by advancing dementia and paresis, with epileptiform convulsions and terminal stupor. Macroscopically and microscopically the conditions found after death were typical of general paralysis. Among other points of interest were the shortness of duration (sixteen months), the rapid onset of dementia, absence of grandiose ideas, and the occurrence of menstruation at an advaneed stage of the disease.

Intoxication in Epilepsy. By Voisin and Petit (*Archives de Neurologie*, April to August, 1895).—The following are the conclusions arrived at by these observers:—

General epilepsy is a hereditary affection, and its manifestations are under the dependance of a particular disposition of the nervous system.

It may, according to the determining causes, be divided into two classes—reflex epilepsy; epilepsy by intoxication.

Reflex epilepsy is not accompanied by gastro-intestinal troubles, and is less grave; whereas epilepsy by intoxication is always preceded and accompanied by gastro-intestinal symptoms, and is graver.

Epilepsy by intoxication may arise from an auto- or hetero-infection.

Reflex epilepsy may be transformed into infective epilepsy, and take its symptoms, course, and termination.

In epilepsy by intoxication, when the condition is accompanied by cortical hemiplegia, there often follows, with the ordinary epileptic dementia, a kind of spasmodic tabes or cerebral diplegia.

The treatment ought to be directed to two points—the predisposition and the epileptic attacks.

The bromides react upon the predisposition of the nervous system, but these drugs ought to be employed in varied doses, and suspended on the appearance of gastric troubles.

The treatment applicable to the epileptic attacks should not be continued in the intervals free from seizures.

The seizures by intoxication may be prevented, and ought to be combated when premonitory symptoms appear.

In true general epilepsy by intoxication the poisoning must be checked, and the elimination of the toxic products favoured by purgatives, intestinal antisepsis, washing out of the stomach, diuretics, injections of artificial serum, hydrotherapy, prolonged baths, dry frictions, and spirit lotions.

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DISEASES OF THE EYE.

BY FREELAND FERGUS, M.D.

British Medical Association.—At the London meeting of the Association the proceedings of the Section of Ophthalmology were not characterised by anything very startling, although a good deal of useful work was transacted. The President's address, however, contained a suggestion which we hope will before long be acted upon by the General Medical Council. Mr. Power advocated very strongly that all ophthalmic surgeons should have a thorough training in physics, especially in the physics of light. The suggestion is not altogether a new one, for high authorities have before now expressed the opinion that ophthalmic surgeons should receive for their very important work as careful a training as dentists do for their profession. We do not wish ophthalmology separated from the great sciences of medicine and surgery. On the contrary, if it is to be pursued with credit, every advantage must be taken of what is new, and at the same time true, in all cognate departments. How close the connection between medicine and ophthalmology really is has only recently received illustration by the remarkable Bowman lecture delivered by Dr. Gowers. Apart from such considerations, however, it cannot be denied that every fresh year the physical problems which ophthalmic surgeons have to undertake are becoming more and more extensive and complicated. It were well, then, that some care were exercised to make sure that a sound knowledge of physics formed the basis of ophthalmic study. Book knowledge is necessary, but, in addition, a training in a laboratory for a period of about as long as the time spent in the anatomy rooms is most desirable. The plan of teaching those intended for the medical profession physics by means of lectures, without laboratory instruction, reminds one of the story of a learned professor who himself was stone deaf, but whose principal vocation in life was to impart to his pupils a knowledge of sound. Ophthalmology no longer solely consists in the administration of medicines, lotions, drops, and ointments, any more than therapeutics consists in writing prescriptions, or pathology in mounting and photographing specimens.

The Bowman Lecture was this year delivered by Dr. Gowers. The subject selected by the learned lecturer was "Subjective Visual Sensations"—that is to say, such visual sensations as occur without external cause. His observations have special reference to the visual sensations which occur in migraine and in epilepsy. He describes them as the vision of the unreal, yet a vision so distinct to the observer that it may even give rise to most painful reflections. Gowers first discusses the relation of such perceptions to the cerebral centres on which they depend. In addition to the half vision centre in the occipital lobe, he believes with Ferrier that there is a higher visual centre near the angular convolution connected with the perception of visual impressions. "Impressions seem to pass to this higher centre in each hemisphere from both occipital lobes in such a way that in each higher centre both fields of vision are represented, but that of the opposite eye in greater degree." These two higher centres are intimately connected with each other. The functions of these higher centres, as understood by Gowers, are shown by the following quotation:—"Note the necessary significance of crossed amblyopia. With loss of the higher visual centre of the left hemisphere, we have in the right eye vision only in a small central region; in the left eye sight remains in a larger central region. In each eye there is a peripheral loss." If one centre is destroyed, this condition of vision must depend on the other centre acting alone. In other words, peripheral vision depends on both centres acting together; macular vision may depend on either centre acting alone. On these higher centres depend the subjective visual sensations.

Gowers next proceeds to give some examples of the visual "warnings"

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which occur in epilepsy. These may vary from simple flashes of light to very complicated pictures. Often there are constant associated disturbances of the other special senses, such as of sound and hearing, and these associated sensations are generally of the same degree of elaboration as the visual.

Often the warning is the appearance of a colour, such as green, red, blue, or yellow. These sensations occur also in migraine. Oddly enough these colour sensations, both in epilepsy and migraine, extend to the very periphery of the field of vision. Speaking of peripheral colour vision in the healthy, the lecturer pointed out that, by suitable test objects, it could be shown that the fields for red and green are almost, if not altogether, co-extensive with the field for white. Referring to the fact that peripheral vision depends on both higher centres being called into activity, Gowers remarks that the colour areas are larger if both eyes are open.

Attention is next called to the relation of sight to movement. This is specially and easily observed in some of the lower animals, in which a definite visual impulse gives rise to a definite movement. The same sort of relation occurs in various forms of epilepsy, in which visual sensations precede the movements which constitute the fit. "Instead of the motion that is seen, there may be a tendency to motion only slight enough to be felt. The motion is that of turning, the sensation of motion is that of vertigo. There are two primary movements of the body—progression forwards and rotation, walking and turning." "In epilepsy there is greater action on one side (of the brain), and therefore there is this rotation, seldom of the whole body, commonly of the head and eyes."

But, further, "an object comes into view on the left side because it is moving towards the right. It is seen first chiefly through the right hemisphere. The visual impulse rouses the motor centres; the eyes and head turn towards the left to 'fix' the object. But the object is moving towards the right, and the first movement to the left is followed by a movement towards the right, to follow it until it disappears at the right edge of the field of vision. Then this long movement to the right is followed by a return to the mid position by the action of the right centres. Note this alteration and its necessary relation to the stimulation of the visual centres of one hemisphere from the opposite eye—motor action first in that hemisphere, then in the opposite one, and, lastly, again in the first action."

Gowers then gives from his note-book a few most instructive cases illustrating the close relationship between the centres of vision and movements, especially of the head and eyes. We regret that limitations of space prevent our giving his cases *in extenso*.

Turning now to migraine, the author discusses the spectra which precede the attacks of "sick headache" and of "blind headache." He at once notes that the subjective sensation preceding epilepsy is rapid, and quickly passes off, while that of migraine is slow and deliberate in its evolution. So, too, the phenomena of an epileptic seizure quickly pass off, whilst the headache of migraine lasts for hours, and as the epileptic attack may consist of nothing beside the sensation, so an attack of migraine may be limited to its spectrum.

A detailed account of the spectra occupies the rest of the lecture. The most important form in migraine is the zigzag or angled spectrum. The feature of second importance is the loss of an area of vision bounded by the zigzag line.

We do not intend to give here the various spectra which the learned lecturer has been able to classify. As to their cause, he confesses himself to be yet just as ignorant as other men. Time only may solve the mystery. One important general suggestion is, however, thrown out by Gowers—viz., that colour vision may after all be central, not retinal, and hence that colour blindness probably does not depend on different elements in the rods and cones. Notable, too, is the fact, to which attention is called, that in these central sensations we have four colours—viz., red, blue, green, and orange; not three or six, as are demanded by the colour theories of Helmholtz and Hering respectively.

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Books, Pamphlets, &c., Received.

The Practice of Massage: its Physiological and Therapeutic Uses, by A. Symons Eccles, M.B. Aberd. London: Macmillan & Co. 1895. (7s. 6d. net.)

Gunshot Injuries: their History, Characteristic Features, Complications, and General Treatment; with Statistics concerning them as they have been met with in Warfare, by Surgeon-General Sir T. Longmore. Second Edition. London: Longmans, Green & Co. 1895. (31s 6d.)

The Climates and Baths of Great Britain, being the Report of a Committee of the Royal Medical and Chirurgical Society of London. William Ord, Chairman; A. E. Garrod, Hon. Secy. Vol. I: The Climates of the South of England, and the Chief Medicinal Springs of Great Britain. London: Macmillan & Co. 1895. (21s. net.)

Edinburgh Hospital Reports, edited by G. A. Gibson, M.D., C. W. Cathcart, M.B., John Thomson, M.D., and D. Berry Hart, M.D. Vol. III. Edinburgh and London: Young J. Pentland. 1895.

The Animal Tuberculoses and their Relation to Human Tuberculosis, by Ed. Nicard. Translated by H. Semfield, M.D. Ed., D.P.H. Cantab. London: Baillière, Tindall & Cox. 1895. (6s.)

Medical Electricity, by H. Lewis Jones, M.A., M.D., being the Second Edition of Medical Electricity, by W. E. Steavenson, M.D., and H. Lewis Jones, M.D. With Illustrations. London: H. K. Lewis. 1895. (10s. 6d.)

Wintering in Egypt, by A. J. Bentley, M.D., and Rev. C. G. Griffinhoofe, M.A. London: Simpkin, Marshall, Hamilton, Kent, & Co., Ltd. 1894.

The Law and Chemistry of Food and Drugs, by H. Mansfield Robinson, LL.D. Lond., and Cecil H. Cribb, B.Sc. Lond., F.I.C. London: F. J. Rebman. 1895. (8s.)

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THE

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ORIGINAL ARTICLES.

A HISTORY OF THE CHRONIC DEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM.

By T. K. MONRO, M.A., M.D.,

Fellow of the Faculty of Physicians and Surgeons of Glasgow; Assistant Physician to the Royal Infirmary; and Pathologist to the Victoria Infirmary of Glasgow.

INTRODUCTION.

The following series of essays formed part of a Graduation Thesis entitled "Essays in Neurology: Historical and Clinical." They are historical studies of those chronic disorders which depend upon primary degenerative changes in the structure of the central nervous system. It is still doubtful whether the peroneal type of family amyotrophy ought to be admitted to this list, but its history is not lengthy, and I have thought it best to include it in the series. On the other hand, I have decided to leave out of consideration in this place two diseases —primary optic atrophy and general paralysis of the insane— which might, from many points of view, be regarded as belonging to this group.

Each essay is introduced by a list of designations which have been applied to the disease whose history it narrates.

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The references collected at the end of each essay are intended to indicate only such treatises and articles as I have myself consulted in the preparation of the essay; and for the constant courtesy and kindness with which he has assisted me to get access to this large body of literature, my hearty thanks are due to Mr. Alex. Duncan, Librarian to the Faculty of Physicians and Surgeons of Glasgow.

Any value that may be possessed by these historical essays is, to my mind, much enhanced by Dr. Gairdner's comments and criticisms which I have introduced in the form of foot-notes. When Dr. Gairdner was examining my Thesis, he took the trouble to write down in that volume some observations which occurred to him, thinking that it might interest me to read them when the thesis again came into my hands. I need scarcely say that I am very grateful indeed for these notes, and my thanks are due in addition to Dr. Gairdner for his kind permission to reproduce them here.

September, 1895.

I. HISTORY OF TABES.

NOMENCLATURE.

Progressive locomotor ataxia (*Duchenne*).
Progressive locomotor asynergia (*Trousseau*).
Posterior spinal sclerosis.
Inflammation or sclerosis of the posterior root-zones of the spinal cord (*Hammond*).
Ataxic tabes dorsalis (*Charcot*—by way of contrast to what he named spasmodic tabes dorsalis).
Tabes dorsalis (*Romberg*), or T. dorsualis.
Consumption of the spinal cord.
Grey degeneration of the posterior columns of the spinal cord (*Leyden*).
Duchenne's paralysis, or Duchenne's disease (*Trousseau*).
Tabes dorsalis, T. cervicalis, T. cerebellaris, &c. (*Remak*—different adjectives being employed according to the predominance of different symptoms).
Posterior leucomyelitis (*Vulpian*).
Myelophthisis.
Sclerosis of the posterior columns (*Erb*).
Progressive spinal paralysis (*Wunderlich*).

HISTORY.

Priority in the recognition of this disease is claimed by an English and a German writer, each for a countryman of his own; whilst in France, a tendency is shown to give a Frenchman a position of at least equal merit with observers of other

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lands. Thus, Dr. Gowers says: "The first really exact account of the disease was published in 1847 by Todd" . . . "The credit of the discovery of the disease belongs, if to anyone, unquestionably to Todd, and few diseases can, with greater truth, be said to have been 'discovered.'"[1]

Professor Leyden says: "Das Krankheitsbild der Tabes dorsualis ist unstreitig zuerst in Deutschland erkannt und präcisirt worden. Romberg, in seinem Lehrbuche der Nervenkrankheiten, hat die erste classische Schilderung dieser Krankheit gegeben."[2]

And M. Raymond says: "Deux hommes out surtout contribué à donner à cette maladie son individualité clinique, Romberg et Duchenne."[3]

When, therefore, a matter of this kind is in such dispute, it is our duty to go back to original sources in an enquiry after historical accuracy.

The expression "tabes dorsalis" was employed by the Hippocratic writers, say 400 years before the Christian era, to indicate a form of marasmus due to sexual excesses, which led on to what we should nowadays term "phthisis," or to some other allied disease, but which, at the same time, presented certain resemblances to diseases of the spinal cord. This was the sense in which the name was employed from the time of Hippocrates[4] to the third decade, at least, of the present century. Thus it comes about that, in recent centuries, we have had an abundance of literature dealing with groups of symptoms which a modern diagnostician would refer to under one or more of the headings, "dyspepsia," "neurasthenia," "sexual hypochondriasis."

History tells us that the famous Greek physician, Democrates, of Abdera, found the tabes dorsalis "so destructive to our brave youth of Abdera," that he felt himself impelled to study its causes. With a view to this, he dissected the generative organs of animals, and he devoted himself so earnestly to this research that his fellow-townsmen, by whom he was much beloved, became alarmed for his health, and sent for Hippocrates, who was then residing at the court of Perdiccas, King of Macedonia. They thought their physician had gone mad, and they believed that, if they lost him, their country would be ruined. Hippocrates, however, was overjoyed when, on his arrival, he learned the nature of his professional brother's pursuits, and, after a few days' residence in Abdera, was escorted back to Macedonia in safety.

Many of the most distinguished physicians of last century wrote on this subject. Thus, Tulpius, the burgomaster and

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physician of Amsterdam, in explaining the consequences of certain sexual vices, says: "the spinal marrow does not only waste, but the body and mind both equally languish, and the man perishes a miserable victim."

Boerhaave, of Leyden, says that such vice causes a "dorsal consumption," and he refers to a case of this kind in which a young man "became so deformed before his death, that the fleshy substance which appears above the spinal apophyses of the loins was entirely wasted."

Mieg, of Basle, to whom, it is said, his country was indebted for the discovery of inoculation; Van Swieten, of Vienna; Hoffman (or Hoffmann), one of the most celebrated practitioners of last century, who distinguished himself by curing Charles VI and Frederick I of inveterate diseases after other physicians had failed; and Ludwig—all taught similar doctrines.

In 1800, H. St. J. Neale published, in London, a work of considerable importance, entitled "Practical Essays and Remarks on that Species of Consumption Incident to Youth, and the Different Stages of Life, commonly called Tabes Dorsalis; with an Account of the Nature, Causes, and Cure of that Distemper and the Diseases arising therefrom, especially the Nervous Atrophia and the Phthisis, or Consumption in General."[5]

Neale remarks that in such cases (viz., spermatorrhœa) either nervous consumption or consumption of the lungs may put an end to life, but there is one noteworthy distinction between the two classes, for in the nervous variety the patient is despondent, while in the pulmonary form he is hopeful. He says that eunuchs are not liable to nervous consumption.

Works of this kind seem to have appealed to a large circle of readers, inasmuch as one of them, a "practical" essay by J. Smyth (in the title of which tabes dorsalis and the venereal disease are associated) had reached its twenty-sixth edition (London) in 1792; while another, "by a physician of Bristol," reached at least six editions in London, and was published in Italian (Venice) in 1785. Yet another "Practical Essay upon the Tabes Dorsalis" (London, 1748) appeared anonymously; but, judging from some remarks in Neale's book, this was probably due to one Lewis. It contains some items of great interest. Thus, among the symptoms mentioned as characteristic of the disease in question, there are not only the regular ones of the class repeatedly alluded to, but, in addition, the "gutta serena" (*i. e.*, amaurosis) "peculiar to the tabes dorsalis," and characterised by dilation and immobility

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of the iris; insensibility of the optic nerve; and also, as was shown by the dissections of Bonetus and Cheselden, atrophy of the optic nerves. A digression may be here permitted, in view of certain questions which have recently been under discussion, to state that this essayist attributes the appearance of secondary sexual characters at puberty to absorption of the "succus genitalis." His remark, moreover, that "the best description of the tabes dorsalis is that of Hippocrates," helps us to understand how rapidly nervous pathology has advanced between 1748 and the present day, as compared with the period between the Hippocratic era and 1748.

The appearance of E. Smith's "Practical Observations on the Tabes Dorsalis or Nervous Atrophy, that Species of Decline induced by" sexual excesses, in 1823 (Liverpool), shows that the same notions still held their ground; so that the great advance in neurology just referred to had not yet fairly begun. As a matter of fact, it has been made almost entirely since the completion of the first quarter of this century.

Nevertheless it is plain that, in spite of their scanty means of diagnosis, these old observers were not altogether wrong; and it is not improbable that the muscular atrophy and deformity described by Boerhaave, and the insensibility of the optic nerve described by the anonymous author, occurred in genuine cases of spinal disease.

A new era, however, in the history of tabes dorsalis began with the publication at Berlin, in 1827, of Hahn's dissertation, entitled "De Tabe Dorsuali Prælusio," in which, for the first time, the name "tabes dorsalis" (or "dorsualis") was restricted to a disease of the spinal cord, corresponding in the main, though of course only in a vague manner, with the condition which we so designate at the present day.

The next period in the history of this malady may be conveniently taken as extending up to 1851—the year of publication of the second edition of Romberg's "Lehrbuch der Nervenkrankheiten."[6] This is perhaps unfair to one of the great English observers (Todd), but unfortunately his writings seem not to have become by any means so well known as they deserved among Continental investigators. Nevertheless, an endeavour will be made to do him justice here. To show how slight is the acquaintance possessed by some well-known authorities with the work of their contemporaries and predecessors, it may be stated that Professor Leyden, writing in 1883,[7] says that Duchenne was the first who recognised inco-ordination, as distinguished from weakness, to be the prominent feature of this disease. On the other hand,

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Professor Erb, writing several years earlier,[8] states that Bouillaud (1845) and Todd (1847) recognised the motor disturbance to be inco-ordination and not palsy. Now, there is no doubt that Bouillaud knew the difference between ataxy and paralysis. He it was who, for the very purpose of marking this distinction, borrowed the term "ataxy" (which, like the term "tabes," comes to us from Hippocrates) from the older writers, particularly Selle and Pinel, by whom it had been applied to certain fevers, such as were called by other authors "nervous" or "malignant" fevers. Yet there is no reason to believe, from what Bouillaud wrote about ataxy, that he ever thought of it in connection with tabes dorsalis, or, indeed, with any definite disease of the spinal cord. Todd's position, then, which will be alluded to later on, marks a great step in advance of Bouillaud's.[9]

In Germany, one of the principal writers, after Horn (1827) and before Romberg (1851), was Steinthal (1844), who gave a clinical history of the disease, and also put on record the first autopsy in Germany.

In France, the earlier investigators were Hutin,[10] Ollivier d'Angers, and Cruveilhier. About 1827, Hutin showed to the Société Anatomique, a spinal cord whose posterior columns were degenerated. (The microscope was not yet employed in researches of this kind.) Monod (1832) worked at the same subject. A glance through an essay which Ollivier (d'Angers) had published in 1824—"De la Moelle Epinière et de ses Maladies"—is enough to show that the knowlege possessed at that date of the morbid anatomy of the cord was, as nearly as it might be, *nothing*.

Cruveilhier had an excellent field for observation at the Salpêtrière, whither all the incurable paraplegics and hemiplegics of the Paris hospitals ultimately found their way. In his "Etudes sur la Paraplégie" he describes the case of a woman, aged 52, who had complete loss of sensation in the lower limbs, with incomplete loss of motor power, and a gait like that of a drunk person. She often fell, and she once broke her leg in this way, it is said. The fracture caused no pain, either at the time, or during treatment. When lying in bed she could execute almost any movement. There was also some numbness and tingling in the fingers, but the power of movement in the upper limbs was almost perfect. The necropsy revealed tubercular changes in the lungs, and yellowish grey degeneration of the spinal cord, limited to the posterior columns. These were involved in their whole breadth in the lumbar and dorsal regions, but in the cervical

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region degeneration was confined to the tracts bordering on the median furrow. The author's remarks are of much interest. He says that in this case paralysis of sensation was much greater than that of movement, but in other cases he has observed grey degeneration of the *posterior median* columns to affect movement much more than sensation. Therefore, he argues, one cannot conclude that the posterior median columns preside exclusively over sensation.[11]

A case such as this is clear as daylight to us, but it shows very plainly some of the riddles that had to be solved before the pathology of posterior sclerosis could be established on a secure basis.

In Germany, Jacoby, in an essay entitled *Exemplum Tabis Dorsualis* (Berlin, 1842), insisted on the localisation of the lesion in the posterior columns and nerve-roots, the anterior columns and roots being intact.

In 1844, Steinthal published a good clinical history of a case, together with the results of the *post-mortem* (made by Froriep). It was a well-marked instance of tabes with motor inco-ordination. The lesion in the cord was in its posterior portion, and there was atrophy of the posterior roots in the dorsal region and in the cauda equina; the optic nerves and chiasm and the right optic thalamus were also atrophied. The anterior nerve-roots were normal.

In Britain, in 1840, Mr. Edward Stanley read a paper to the Medico-Chirurgical Society of London on a case in which well-marked changes were found, after death, in the posterior columns, from the lower end of the cord up to the pons. Disease of the anterior columns or roots had been anticipated, but these were found to be normal. It was, therefore, inferred that the doctrine of the possession of distinct motor and sensory functions by the anterior and posterior nerve-roots respectively could not be extended *simpliciter* to the anterior and posterior columns respectively. The clinical report of the case shows that the upper limbs were normal. The lower limbs were normal as regards sensation. At first, by a great effort, the patient could, while sitting in a chair, raise his legs from the ground; but latterly he failed to do this. Mr. Stanley referred to a case recorded at Paris in 1838 by P. Malle as having occurred at Strasbourg. It was characterised by softening of the posterior columns from the fifth cervical to the third dorsal level; during life there had been less of mobility of the upper limbs, but not of sensibility.[12]

The next writer to be mentioned is Todd (1847), whom Dr. Gowers credits with the "discovery" of the disease.

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Todd, arguing against the view that the posterior columns have a sensory function, appeals to the teaching of normal and morbid anatomy, and remarks that even Sir Charles Bell had given up this view in his work published in 1844. He quotes the cases of Webster (where he had himself seen the spinal cord) and of Stanley to prove that sensation may exist in the lower limbs independently of the posterior columns. He also cites cases recorded by Cruveilhier, Budd, and Serres, where motion was lost and sensation was preserved, though the posterior columns were diseased. Todd, therefore, expresses himself as being strongly of opinion that the office of the posterior columns is something very different from anything hitherto assigned to them. They might be in part commissural between different segments of the cord, and in part subservient to the function of the cerebellum in regulating and co-ordinating the movements necessary for perfect locomotion. "In many cases in which the principal symptom has been a gradually increasing difficulty of walking, the posterior columns have been the seat of disease. Two kinds of paralysis of motion may be noticed in the lower extremities—the one consisting simply in the impairment or loss of the voluntary motion, the other distinguished by a diminution or total loss of the power of co-ordinating movements. In the latter form, while considerable voluntary power remains, the patient finds great difficulty in walking, and his gait is so tottering and uncertain that his centre of gravity is easily displaced."[13] In two cases of the latter kind, Todd predicted disease of the posterior columns in accordance with this theory; and his predictions were verified by *post-mortem* examinations. On looking over the records of cases of disease of the posterior columns, he finds that they all seem to have shown, in the first place, locomotor disturbances, sensation being affected only when disease extended to and involved the posterior roots of spinal nerves.

The case recorded by Dr. Webster, and mentioned by Todd, was reported to the Medico-Chirurgical Society of London on the 8th November, 1842, and was afterwards published[14] as a "Case of Paralysis, without Loss of Sensation, from Disease of the Cervical Medulla." The description makes it clear that it was not a typical example of tabes. The lesion in the cord was not confined to the posterior columns. Todd examined the cord microscopically, and found that the antero-lateral columns, the posterior horns, and probably the anterior horns also, were involved. He believed it supported his theory that the posterior columns do not convey sensory impressions to

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the brain, or, at least, are not the only channels through which such impressions pass.

No doubt Romberg owed much to our great countryman, Sir Charles Bell, whom he styles "the Harvey of our century," but he was himself no mean authority; and the appearance of the second edition of his well-known Textbook (1851) must be regarded as marking an epoch in the progress of neurology. He recognised the disease now under consideration as a distinct morbid entity, and appropriated for it the designation "Tabes dorsalis," which, though of ancient origin, had as yet possessed but an ill-defined significance. He gives a tolerably full description of the malady; points out the symptom now known by his name—viz., the insecurity on standing erect in the dark, or with the eyes shut (he says he called attention to this ten years before); and notes the frequent occurrence of amblyopia, and—even when the optic nerve is not implicated—"a change in the pupils of one or both eyes, consisting in a contraction with loss of motion." Patients with this disease, "if they are members of the higher classes, anxiously endeavour to conceal their loss of motor power, in order to avoid the evil reputation of being affected with tabes dorsalis." This is an indication of the extent to which the idea that sexual excesses were the cause of the disease known as tabes dorsalis still lingered in the popular mind. Romberg says that the first symptom is reduction of the motor power in the muscles, first and foremost in the lower extremities. "The patient complains of weakness and inability to perform any movements," and the sense of touch and the muscular sense are diminished early in the disease. This writer does not attribute nearly so much importance as previous authors had done to sexual excesses in the etiology of tabes; he rather thinks that rheumatism from exposure, hard work, &c., is a more fruitful cause. Romberg describes further the principal naked-eye lesions.

It is particularly to be noted that Romberg, writing four years later than Todd, failed to recognise that in this disease he had to deal with motor inco-ordination, and not with motor paralysis.[15]

In 1855, Dr. J. Russell Reynolds published his work on *The Diagnosis of Diseases of the Brain, Spinal Cord, Nerves, and their Appendages.* In this treatise, the distinction between "anæsthesia muscularis" and loss of power is clearly noted, as well as the frequent association of diplopia with the former condition. "It appears most probable (especially since this is the first change in cases which subsequently exhibit perfect

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paraplegia) that the centripetal tract of fibres is affected."[16] The author states that he has repeatedly found loss of the muscular sense to exist alone in cases that had been termed paraplegic, but that this condition ought to be carefully separated from paralysis in the ordinary sense of the word.[17]

Palsy of the muscular sense had been noted by Charles Bell in 1822, and Duchenne had described analogous pathological facts in 1850.[18]

In 1858, Dr. (afterwards Sir William) Gull recorded[19] a well-marked case of locomotor ataxy, with the spinal lesion limited to the posterior columns. It is included in his second series of "Cases of Paraplegia." Dr. Gull remarks that this case confirms Todd's theory as to the functions of the posterior columns.

The next period in the history of tabes is marked by the publication, in 1858-1859, of Duchenne's papers, *De l'Ataxie Locomotrice Progressive*.[20] Duchenne's account of the disease was fuller than any that had yet been published, as is admitted even in Germany. This affection was to him absolutely new, for it was the practice of this extraordinary man (who never had an hospital appointment) to read the writings of others after he had completed his own researches, and not till then. Believing the disease to be as yet undescribed, he gave it the name which recalls its most prominent symptom. He discovered the malady for himself, but his is not the merit of priority. Nevertheless, his description was quite new to his countrymen, and a French writer has said: "Who does not recollect the astonishment exhibited in the clinic by that experiment of Duchenne of drawing from his bed a patient regarded as absolutely paraplegic, and loading him with the weight of a man of ordinary size, without his ever flinching under it?"[21] Duchenne's attention was first called to Romberg's description in September, 1863.

About 1852, Duchenne was engaged in the investigation of the force of muscular movements in health and in disease; and he soon found that many affections called "paraplegias" or "general paralyses" were no such thing: nay, that in many cases the power of movement, if actually measured, would be found to be considerable. In 1857, he made a communication to the Medical Society of Paris on this disease as a distinct morbid entity ("comme espèce morbide distincte").

As Dr. Poore remarks, Duchenne's picture of locomotor ataxy must still be regarded as almost complete, comparatively little having been added to it since it first left his hands.[22]

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Trousseau, by his famous *Clinical Lectures*, did a great deal to make Duchenne's observations widely known.

It now remains for us to deal with the facts that have been added to our knowledge since Duchenne wrote; a few are of enormous importance, as occurring very early in the disease, and so giving the physician a clue to the nature of the malady at a much earlier stage than could until lately have been hoped for.

First, then, there is the loss of the knee-jerk, for this name is as convenient as any other of the numerous terms which have been applied to the same phenomenon. The recognition of this symptom is due to C. Westphal. This writer had noticed, in 1871, that blows on certain tendons could call forth muscular contraction, and he continued to study these "tendon-phenomena," as he called them, in cases of disease. In his first published paper on the subject of tendon-phenomena (1875), he pointed out that the "knee-phenomena" is abolished in tabes. This was speedily corroborated by Erb and O. Berger. In a very important communication[23] made, on the 7th November, 1877, to the Medical Society of Berlin, Westphal showed the great value of this symptom for early diagnosis. In a later article (1881),[24] he discussed the question of the seat of the lesion which abolishes the knee-jerk, in connection with a case which ended fatally at a very early stage of the spinal disease, the knee-phenomenon having been still present when the patient first came under observation.

Erb concluded that the loss of the knee-jerk was the most constant and the earliest of the symptoms of tabes; but, before very long, some exceptional cases were put on record, in which the knee-jerk persisted.

Ernst Jendrassik, of Buda-Pesth, showed, in 1883,[25] that during strong muscular activity the knee-jerk is obtainable in more marked degree than under ordinary circumstances—a fact which is taken advantage of by physicians in cases where, on first testing, the jerk appears to be diminished or absent.

In the second place, there is the pupil. That symptom which is known as the Argyll-Robertson pupil is present in a large majority of cases of tabes. It was first described by Dr. Argyll-Robertson, of Edinburgh, in 1869.[26] It is a pupil which does not contract to the stimulus of light while still contracting in accommodation, or, to speak more accurately, in convergence of the visual axes. Dr. Argyll-Robertson's observation was made on an ataxic patient who complained

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of dimness of vision in both eyes. Neither pupil contracted to light, but both contracted when the patient looked at a near object. Both pupils were very small, and were difficult to dilate with atropine. The visual fields were contracted, and there was some degree of colour-blindness. Dr. Robertson considered the myosis to be due to paralysis of the dilator of the pupil from disease of the spinal cord. He had already had a case of spinal myosis under his care, and had seen several at Remak's clinique in Berlin. He was also acquainted, when he published his case, with Romberg's statement that in tabes there may be "a change in one or both pupils, consisting in contraction with loss of motion." The "Argyll-Robertson symptom," therefore, is the reflex iridoplegia, and is not necessarily associated with myosis, as might be inferred from some text-books, though, of course, myosis often is present.

"Gastric crises" were so named by the late M. Charcot, who states, in his *Lectures on Diseases of the Nervous System*,[27] that their connection with tabes was first pointed out by Delamarre in 1866. Charcot himself lectured on them in 1868. But Gull had suggested, as early as 1858 (as Charcot points out), that attacks of vomiting in a case of disease of the posterior columns were probably attributable to the spinal lesion. Gull made this suggestion in connection with his case of locomotor ataxy, to which reference has been already made. Topinard also, in 1864, remarked upon the occurrence of these attacks in tabes, but considered them to be merely a complication.[28]

Féréol described "laryngeal" or "bronchial crises" in 1868, in a collective work on the subject of these complications of tabes. He recalled the fact that Cruveilhier recorded a case of this kind in 1825.

In 1876, Raynaud and Lereboullet described "nephritic" or nephralgic crises. Attacks of pain in the face and head were described by Pierret in 1876; but severe pain in the head was a symptom in Duchenne's first case.

In 1879, Berger and Rosenbach, of Breslau, called attention to the relative frequency of aortic insufficiency in cases of tabes.[29]

A great variety of trophic lesions are now recognised as occurring in cases of locomotor ataxy.

Tabetic arthropathy was first described by Charcot in 1868.[30] Weir Mitchell had recorded, in 1831, two cases of Pott's disease complicated with arthropathy;[31] and arthropathies of the *paralysed* limbs in paraplegia had been described by Scott Alison in 1846.[32] Suppuration of a tabetic

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joint is exceptional, but such an occurrence was described by Bourceret in 1875.[33]

Spontaneous fractures of bone in tabid patients were described in 1873 by Charcot in France, and by Weir Mitchell in America, almost simultaneously. A case has been already quoted from Cruveilhier, who wrote at a much earlier date, but who was not then in a position to appreciate the significance of the symptom, though he described it faithfully.

The "tabetic foot," or "tabetic club-foot" ("pied tabétique"), due to the occurrence of changes in the tarso-metatarsal articulations, was so designated, in 1883, by Charcot and Féré, when describing the four cases of this lesion known at the time.[34]

For our knowledge of the pathology of perforating ulcer of the foot, a well-known complication of tabes, we are indebted to Duplay and Morat.[35] Nelaton had described a case in 1852. Immediately afterwards, Vesignié recorded other instances (1852), and gave to the condition the name "mal plantaire perforant." He considered it to be a variety of psoriasis. Later writers, *e. g.*, Pean (1863) and Raynaud (1865), thought it was due to atheroma of vessels. Lucain, whilst recognising this as the usual cause, suggested that a few cases might be due to nerve degeneration. Duplay and Morat (1873) showed that changes in nerves or in the central nervous organs are the cause of all cases. Among the numerous examples collected by them, several were in subjects of tabes. Paul Bruns, of Tübingen, published important papers[36] on this subject in 1875. While the value of Bruns's contribution is recognised in France, this author, on his part, states that the disease is a French discovery.

Desprès has recorded a case of perforating ulcer of the hand; this is a rare thing. In the same communication, he records a case of perforating ulcer of the foot in a woman—an occurrence which he styles "une rareté parmi les raretés."[37]

I may here allude to a rare case which I saw at Professor Fournier's Clinique in Paris, in 1889. It was one of symmetrical perforating ulcers, one of which was situated on the inner aspect of each buttock.

In 1881, Strauss described "tabetic ecchymoses" ("ecchymoses tabétiques"), which may occur in any part of the body affected by lightning pains.[38]

Charcot pointed out[39] that muscular atrophy is not uncommon in tabes, and he referred to a communication by Pierret in 1870. Leyden (1883) called attention to the changes which sometimes occur in the cells of the anterior horns of

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the spinal cord. Westphal first (1878), and afterwards Pierret (1880) described changes in the cutaneous nerves in cases of this disease. Déjérine (1883) did much to show the importance of these peripheral neurites in tabes, and remarked on the part which they probably play in the production of inco-ordination. The work of Pitres and Vaillard (1883) ought also to be mentioned here. In a later study[40] (1884), Déjérine proposed the name "peripheral neuro-tabes" ("nervo-tabes périphérique") for cases of peripheral neuritis with symptoms resembling those of locomotor ataxy. Still later (1889), the same author described[41] muscular atrophy as occurring in tabes in consequence of disease of peripheral motor nerve-fibres.

The somewhat equivocal position still occupied by deafness as a symptom of tabes, makes it of minor importance for us at present. But it may be stated that, in 1882, Strümpell published a case of complete deafness from atrophy of the acoustic nerves. In 1866, Lucae had mentioned two cases of deafness in tabes, and, in the first case described by Duchenne, hearing was quite lost in one ear.

While, in typical cases of locomotor ataxy, the mental faculties remain unaffected, it has long been known that this is not always so. According to Raymond, a case was recorded by Horn in 1833, in which dementia paralytica was associated with locomotor ataxy. Since then, many alienists, particularly in France, have published cases in which delirium, hallucinations, &c., have occurred. Hoffmann, Türck, Baillarger (1862), Magnan, Falret, Topinard (1864), Jaccoud, Luys, and Foville fils (1873) are some who may be named. We are indebted to Westphal perhaps more than to any other recent writer, for our knowledge of this subject.

In 1881, Westphal published a case which is of special interest, on account of the opportunity it furnished him of investigating the very earliest lesions of tabes. The patient was the subject of dementia with délire des grandeurs, and amaurosis. He was watched during two years for the first indications of tabes. At length one knee-jerk was lost, and soon afterwards the other. The patient died within a few weeks. The spinal cord was normal to the naked eye, but after hardening, some degeneration was found in the lateral columns and in Burdach's column.

Rokitansky and Türck (in the sixth decade of this century) are to be credited with taking the lead in studying the histological characters of posterior sclerosis. This they did in well-marked and advanced cases of the disease; but modern

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diagnostic methods have given us the opportunity of recognising the disease in its very early stage, and so of examining, on rare occasions, a cord which has as yet undergone but little change. The early lesions were investigated in this way, about 1872 and 1873, by Pierret, who worked under the direction of Charcot.[42] Pierret concluded that the disease begins with two symmetrical islets of sclerosis in the outer divisions of the posterior columns. (The "postero-external columns" are also called "Burdach's columns," or the "posterior root-zones;" or, in French, "bandelettes externes," "rubans externes," or "zones radiculaires postérieures.") He said that this was the essential lesion, and that the sclerosis of Goll's columns was a secondary degeneration. Charcot and Vulpian endorsed Pierret's view; but Strümpell, of Leipsic, showed that the innermost part of Goll's column is, in some cases at least, sclerosed at the very outset.

The discovery by Lissauer of the tract of fibres known by his name may be mentioned here, as it was first described (in 1885) in connection with its disease in tabes.[43]

Writing in 1863, Leyden stated that the difference between inflammation and sclerosis of the spinal cord was so marked, as to justify us in separating diseases of the cord, as Vulpian had proposed, into two great classes—viz., funicular or fascicular (strangförmig) and focal (herdförmig). The latter are more inflammatory, the former more degenerative in their nature. The funicular differ from the focal group in involving a much greater length of cord, and in affecting particular fibre-tracts. As Flechsig named sets of fibres which are alike in course and function, "fibre-systems," so Leyden proposed to name diseases of these fibre-systems, "system-diseases" of the cord.[44]

The difficulty experienced by an ataxic patient in walking backwards ("Althaus's symptom") was pointed out by Dr. Althaus in 1884.[45]

One of the most important recent controversies in connection with tabes has been with regard to the influence of syphilis as a predisposing cause. Every one admits that the tabes of a syphilitic is the same as that of a non-syphilitic person, and that there is nothing specifically syphilitic in the morbid anatomy of locomotor ataxy. Duchenne recognised, in 1859, that syphilis sometimes precedes ataxy, and also that anti-syphilitic treatment does not cure tabes. In 1871, Dr. Buzzard included progressive locomotor ataxy among the nervous affections belonging to the tertiary stage of syphilis.

The fact of the association of tabes with late syphilis, noted

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as it had been by Duchenne, Lancereaux,* and Schultze (1867), was brought prominently forward by Fournier in 1875. In 1878, Dr. Gowers asserted, at the meeting of the British Medical Association, that syphilis is the cause of half the cases of locomotor ataxia. This view was supported by Vulpian in 1879, and in the same year by Erb, who, when he wrote the article in Ziemssen's *Cyclopædia* (1876), had been in doubt on the subject.

The opposite side was taken by Westphal, Remak, and Bernhardt (all in 1880).

Dr. Buzzard (1882), adding together the statistics of Fournier, Erb, and himself, obtains a syphilitic percentage of 59·8 in tabes; yet he considers the causal relationship between the two to be doubtful.[46]

Hippocrates, or rather the pseudo-Hippocratic writers, attributed tabes dorsalis to sexual excesses,† and it was only in the present century that a direct and close relationship between the two was disproved. But within recent years syphilis has come in as one of the most important etiological factors; and as syphilis is, in men—and it is they who are the principal sufferers from tabes—almost invariably due to deviation from strict sexual morality, it may be that, after all, the writers of the pre-Christian era were not entirely in error. Thus increase of our knowledge brings us back to where we were thousands of years ago; for, as Sir Thomas Browne remarks,[47] "old Truths voted down begin to resume their places." Yet we do not return exactly to the same position. As the old man Clifford (in *The House of the Seven Gables*) puts it, in one of his lucid intervals, "All human progress is in a circle; or, to use a more accurate and beautiful figure, in an ascending spiral curve. While we fancy ourselves going straight forward, and attaining at every step an entirely new position of affairs, we do actually return to

* Lancereaux, however (though he may have admitted the *association* occasionally as a fact), was strongly and emphatically opposed to the idea of a syphilitic *causal* relation, as you will find on consulting his works, and also (I think) in the discussion of Erb's paper at the London International Congress, 1881, at which Lancereaux was present.—W. T. G.

† I wish you had attempted to show from actual quotations what amount of real substance there was in those old post-Hippocratic views of the *φθίσις νωτίας*.

My own impression is that there was very little, and that, in clinging to the mere *name* of tabes, or tabes dorsualis, the Germans have simply perpetuated superstition and confusion.

This is the more remarkable, as Romberg, while using, or indeed reviving the name, emphatically protested against the theory of sexual abuse and emissions which it implied.—W. T. G.

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something long ago tried and abandoned." The same idea has been expressed by different writers when dealing with very different subjects.

Locomotor ataxy possesses a melancholy interest for those of our profession who are admirers of Heinrich Heine. The great German poet, after terrible suffering, died of this disease in Paris, on the 17th February, 1856.[48]

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(*To be continued.*)

CASES OF FUNCTIONAL PARALYSIS; TREATMENT BY HYPNOTISM, MYELIN, &c.; RECOVERY.[1]

BY ALEX. ROBERTSON, M.D.,
Physician to the Royal Infirmary, Glasgow.

THE nervous system, doubtless largely owing to its fineness and delicacy of organisation, is peculiarly subject to disorders of a functional kind. Such disorders are met with in all its great divisions. Many forms of insanity illustrate their occurrence in the highest department of all—the sphere of mind. The variety that correspond most with the cases, related chiefly to motor and sensory functions, which are recorded in this paper, is stuporose insanity, or briefly stupor, formerly known as acute dementia. In it there is almost complete abolition of mental function. The power of attention,

[1] Paper read at the Eastern Medical Society, Glasgow, March, 1895.

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memory, and the reasoning faculty are lost, sometimes partially, but generally altogether for a time. But the condition passes away, and the patient is usually restored to complete mental health in two or three months, occasionally sooner.

In the province of sensation, both special and general, temporary abeyance of function is of not unfrequent occurrence. A number of years since, at a meeting of the Medico-Chirurgical Society of this city, I showed a patient, a man about 30 years of age, into any part of whose skin pins could be thrust without producing the least indication of feeling. All other forms of sensibility were also lost. He likewise suffered from the form of mental disease known as melancholy with stupor. He recovered after some months. For many years there was from time to time under my care in the City Parochial Asylum a young woman who ultimately died insane. At the beginning of her illness she had complete anæsthesia of one half of her person—face, arm, leg, and body—with no motor weakness. She had also, simultaneously with these defects, loss of colour sense on the same side.

More or less ephemeral impairment, or total loss of motor power not dependent on organic disease, is present in the many forms of the so-called hysterical paralysis. It is also due to reflex causes. Long since (*Medical Times*, 1865) I recorded a case in which nearly complete paraplegia in an adult man was apparently caused by ascarides in the rectum; at all events, he rapidly recovered after their removal.

In the sphere of nutrition, local and temporary defects, dependent on central nervous disorder, are by no means rare. An interesting form is the rapid wasting that occasionally occurs in the muscles related to a joint which is the seat of subacute rheumatism. Two cases of this kind came under my care about eighteen months ago. In one of them great wasting occurred in the deltoid and muscles on the front aspect of the upper arm within a few days. The atrophy lasted some weeks, and then passed away. At the onset of the wasting the shoulder joint was painful, but not acutely so. Without entering into the reasons of the conclusion, it may be stated as the most probable explanation that the irritation—to use a vague word—of the sensory nerves in the joint in such cases extends to the associated nutritional centres in the anterior horn of the cord, exerting a blighting influence on the grey matter of a temporary kind, without organic change of structure.

In the cases recorded in this paper the defects were both motor and sensory.

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CASE I.—A. W.,[1] age 39, single, railway signal fitter. His first admission into the Royal Infirmary was on 2nd February, 1894.

State when admitted.—He is strongly built and healthy looking. He states that he had three illnesses before the present attack, which he believes were of a similar nature—the first when 16 years old, the second at 27, the third at 29. In the intervals he was well and fit for work. He has always been temperate. There is no history or evidence of specific disease. Family history is good. Present illness is of eight days' standing. No cause is known. It began with sudden pain in the forehead, giddiness and weakness in the legs, so that he was unable to walk without help. The pain in head is now constant, but varies in degree; says it is of a heavy, gnawing character. He speaks of a strange creeping sensation in the legs, and sometimes also in the arms. The special senses are unaffected. Memory and intelligence have greatly failed. He lies in bed with a dull, absent expression. He has a little thickness of speech. Tongue is protruded straight, and there is no fibrillary movement in it. The dynamometer registers 6 kilogrammes with each hand; the average for a labouring man with the same instrument is from 40 to 50. Sensation is good; he can distinguish the two points of the æsthesiometer at 5 c.c. Superficial and deep reflexes are present in the lower extremities; the latter are somewhat exaggerated. There is no weakness of bladder or bowels. Temperature, 98·6; pulse, 72; urine contains a trace of albumen; appetite poor.

The treatment prescribed on admission was sinapisims to the neck and mustard foot baths. Afterwards a fly-blister was applied to head, and antipyrine given internally. On 10th March, five weeks after admission, a note by me bears that the headache has been much less since the application of the blister. However, his motor power was further diminished. Thus, on attempting to stand or walk, he would fall if left unsupported. He now failed to move the index of the dynamometer at all; but sensation and power of bladder and bowels continued normal.

On 3rd March myelin[2] was begun in 1 dr. doses thrice daily. Patient's general condition was then as follows:—

[1] The patient was shown to the meeting, when he said he was quite well, and certainly looked so.

[2] Myelin is the fresh brain of the sheep mixed with glycerine and aromatics (see paper by writer in *British Medical Journal*, 26th December, 1893).

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Pulse, 76; respirations, 25; axillary temperature, 98; bowels constipated; urine normal. In a note on the 24th of same month it is stated that on the 15th, three days after myelin was begun, patient's aspect was improved; he was more cheerful, and showed greater mental activity. There was also increased power in the grasp and in his lower extremities. On the 18th he could not only stand, but walk a few steps; and on the 22nd he could walk up and down the ward, though a little shaky. On the 16th the myelin was increased to 2 drs. thrice daily before food. There was no change in his pulse, temperature, or other functions above noted. The improvement continued, and on the 21st April he left to resume work. It could not, however, be said that his recovery was perfect.

Patient was readmitted on 27th October. He states that after his return home he was only able to work one week on account of weakness in legs. The pain in the head had not returned, nor has there been any recurrence of the difficulty in speaking which he had when first admitted. The grasp showed 8 kilogrammes with right hand and 7 with left on the dynamometer. His mental condition has not suffered seriously on the present occasion, though there is some mental depression. He can walk a little, but not above a few yards unless assisted. He was again put on myelin in 1 dr. doses thrice daily before meals, and it was continued till 2nd December, when it was stopped. At that date there is a note to the following effect:—Motor power is much improved, especially that of the arms. The grasp now shows with the right hand 49 kilogrammes and 43 with the left. He can walk up and down the ward without much difficulty; still there is an obvious weakness of the legs. Mentally he is depressed, though less so than when first readmitted.

On 5th December he was hypnotised by me, and kept in the hypnotic state for about ten minutes; suggestions of restored power to his limbs and complete recovery were made to him during that time. On the following day he had a brighter expression of countenance, and his mind was clearly more active. He had also a firmer step in walking.

Three days afterwards he was again hypnotised. This was followed by complete recovery. He was kept under observation in the ward till the 21st December, but there was no disposition to a relapse, and on that date he was dismissed well.

CASE II.—S. M., age 23, single, millworker—admitted into Infirmary, 27th November, 1894. Patient states that since

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the age of 11 she has been subject to "fits," during which she becomes unconscious. She is perfectly still while in them, and says she does not laugh or cry, or bite her tongue, nor does she wet her clothes. They last for about a minute. There is no warning before they come on. She has never had a feeling of a ball in her throat. There is no evidence of specific disease or history of alcoholism, though a suspicion is entertained by the nurse that patient has led an irregular life. There is nothing suggestive in the family history. Patient states that about ten days since she had a trembling of the whole body, with chattering of the teeth. This lasted to a greater or less extent for six days, and then gave place to "pains" in the soles of the feet, which gradually extended up the legs to the gluteal regions. They have been constant since then with the same degree of intensity, but they have not gone higher. State on admission recorded by Dr. M'Coll, house physician:—

Face flushed; pupils unduly dilated; perspiring freely; general nutrition good. There is marked analgesia of lower extremities and trunk of the body, with the exception of the soles of the feet, the upper surface of the toes, the gluteal region, and a few small areas on the front of the chest. A pin was inserted at several points to the depth of ¼ inch without indication of pain; no blood issues from the point of insertion. Anæsthesia, coequal in extent with the analgesia, is present. The special senses are unaffected; it is noticed that she can easily distinguish colours. Pupils react to light and accommodation. She cannot walk without support, and then only very feebly, resting chiefly on her heels. The plantar reflexes are present. The knee-jerk is exaggerated on both sides, and patellar clonus is readily elicited. Ankle clonus cannot be brought out. Muscular sensibility does not appear to have suffered. (This last is doubtful).

On 30th November, it is noted that on the outer surface of left leg there is no sensation on the application of hot and cold test tubes; but on the inner aspect of the same leg, about one-third from the ankle, she can distinguish both heat and cold. On right leg she has no sensation on the application of heat, but at once recognises cold. Tactile sensation is in abeyance everywhere in both legs, and sharp pinching is not felt. Both tactile and painful impressions in the trunk are not appreciated below the mammary regions; the line of sensory defect is about 1½ inches lower on the left side than on the right. The muscles of both legs contract readily to the Faradic current. The wire brush in connection with this

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current was drawn over the skin of each leg for about five minutes. On then testing the sensibility, pinching the left one caused slight pain, but was not felt on the right. The next morning, 1st December, all the forms of sensibility were fully restored, with the exception that she failed to distinguish heat from cold on the right leg below the knee; motor power had also completely returned. She walked well, and indeed no defect was observable in the firmness of her step. She states that feeling came back late last night, and thinks herself quite well in this respect. The deep reflexes, particularly the patellar, are still rather active. Further careful examinations of the sensory and motor functions were made on the 3rd, 4th, and 8th December, and they were found normal. A vaginal examination was made by Dr. J. K. Kelly, who reported that the uterus and ovaries were small and undeveloped. The cervix was small and soft, and the os was patulous with enlarged follicles around it. She was dismissed cured on 9th December.

In the first of these cases the improvement was so great and so speedy on both occasions after the use of the myelin, that it was difficult to avoid coming to the conclusion that the change for the better was due to this agent. Care was taken to avoid explaining its nature to the patient, though I have little doubt he would soon come to know what it was. It is certainly open to question if the *idea* of a new, and what might appear to him mysterious agent, had not much to do with the etiology of the improvement. Still the impression remains on my mind that some constituent of the myelin had probably stimulated his brain-cells, and that the partial recovery might correctly be attributed to it.

I have now administered this medicine in a considerable number of cases, both of organic and functional diseases of the central nervous system. Where there was organic mischief I have not seen clear evidence of benefit from its use. In functional disorders, particularly the less severe forms, it has occasionally been of distinct service. I am disposed to regard it as a special but mild stimulant, more particularly in states of depression of the brain and nervous system generally.

Perhaps even more decided and striking was the completion of the patient's recovery under hypnotism. The idea suggested to his mind, while in this state, of complete restoration to health seemed to exert a powerful stimulating action on the brain. Such cases are fair and legitimate fields for the use of this remarkable agent. The mere fact that it has

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been so long in the hands of charlatans, and indeed is largely in their hands still, should not deter us from availing ourselves of its powers when there is reasonable ground for expecting that it may favourably influence the progress of disease, whether of mind or body.

In the second case, the most remarkable feature was the rapid recovery from the all but complete abolition of sensory function, and the less complete but still very marked impairment of motor power. There was absence of ordinary hysterical symptoms, but there can be no doubt that the condition of the patient was closely allied to, if not identical with, what exists in cases of that kind. But to name it hysterical is to use a mere cloak for our ignorance of its nature. I prefer to call it functional, for it conveys the impression that it is the office or sphere of action of the organ involved which is disordered or in abeyance for the time. It also suggests, what is desirable to bring out in relief, that no important structural change exists, but only some molecular disturbance, inappreciable to our means and powers of investigation.

It has only further to be remarked that it is in such cases that electricity reaps its most brilliant successes. The disappearance of symptoms of such apparent gravity within twenty-four hours after the application of the Faradic current was very striking.

CLINICAL CASES FROM GENERAL PRACTICE.

By TRAFFORD MITCHELL, M.D. Glasg.,
Gorseinon, Glamorganshire.

1. *Accidental Radical Cure of a Femoral Hernia.*

On 22nd February, 1894, I was called to attend M. R., aged 54 years. I found that she had been the subject of a right femoral hernia for four years; that the truss she used was a very badly fitting one, and that for seven days prior to my visit she had been unable to return the contents of the hernia to the abdomen. There had been during the week constipation and nausea, but little vomiting, and there was considerable pain in the groin. The hernia had turned up over Poupart's ligament, and was dull on percussion and very tense. Dr. T. M. Jones, who had applied the taxis to this patient on many previous occasions, kindly came to my assistance, and, after twenty minutes manipulation under chloroform, he

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succeeded in returning the chief mass of the hernia to the abdomen. A small hard swelling, however, about half the size of a pigeon's egg, still remained in the groin. For the next eight days there was slight rise of temperature and pulse, with fulness in the right iliac fossa, constipation and vomiting (not stercoraceous), and increased swelling in the groin. As the patient and her husband strongly objected to any operative interference, we had recourse to poultices on the groin and abdomen, aperient enemata, and the free use of opium and gastric sedatives.

On 28th February, superficial redness of the skin of the groin appeared, and on 2nd March the patient consented to a free incision, which resulted in the removal of two ounces of very offensive pus. A drainage tube was inserted, and strict cleanliness observed, and on 7th March the sac in a sloughing state was seen projecting from the wound, and was removed with a pair of dressing forceps. After the removal of the slough, the patient made a rapid recovery. So firmly did the inflammation close the crural canal, that the hernia has never again descended, no truss has been used, and the patient has experienced no discomfort of any sort.

2. *Fracture of Thigh Accompanied by Motor and Sensory Paralysis of Leg and Foot.*

W. P., aged 13 years, was knocked down in a colliery on 27th July, 1894, by a small carriage called a "tram," fracturing both thighs just above the middle. The left thigh was doubled right on to the patients' back, and it was noticed that he was unable to move the foot and toes of the left side, whilst he could freely move those of the right side. Both limbs were put up in the ordinary fashion with the long splint, but in four hours the bandages of the left side had to be loosened on account of swelling in the leg and foot, and twenty-four hours later all apparatus were removed from the left limb in consequence of extensive vesication. Absolute paralysis of motion and sensation below the knee, with extensive sloughing of the leg and foot suggested the possibility of the great sciatic nerve having been injured, but though the sciatic nerve and its branches were exposed by an incision extending from the sciatic notch to near the middle of the calf, no solution of continuity of nerve substance was discovered, except in the case of a few slight cutaneous twigs which had become involved in the sloughing. The boy is now able to walk well, and even to run without the aid of stick or crutch, but there is still absolute paralysis of all muscles

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having their origin below the knee, and total loss of sensation in the leg and foot. The leg is thin and wasted, but there is no process of necrosis going on now, except that the skin of the point of the heel and at the back of the leg, where the upper edge of the boot presses, is apt to break down very frequently—no doubt due to some obscure trophic neurosis. There is no response to electricity and the reflexes are lost.

The right limb recovered in the most satisfactory manner; but, owing to the impossibility of maintaining apparatus on the left one, the latter is slightly bent, and there is an excessive amount of callus.

The site of the injury to the nervous system remains a mystery, though the patient has been examined by many hospital surgeons.

3. *Fracture of Base of Skull; Recovery.*

On 11th March, 1895, D. J., aged 29 years, fell head foremost from a height of 15 feet on to a mass of bran, striking his head against a railway waggon in his descent. He was picked up insensible, but in ten minutes regained consciousness, when distressing vomiting at once set in, and continued for more than an hour. The only external injury he sustained was a contusion on the right temple 1½ inches above the zygoma.

Blood flowed freely from the right ear; but after two hours the discharge became more watery, and at the end of three days it had become perfectly limpid. This colourless serous discharge lasted for a week.

Deafness of the right ear was very marked at first, but is now scarcely perceptible.

Facial paralysis was observed immediately after the accident, and has shown no signs of improvement. Sensation was not impaired in the face.

The patient was kept for three weeks in a darkened room, with cold applications to the head, and was placed on a low diet. Small doses of calomel (2 grs.) were administered twice daily during the first week. No rise of temperature or of pulse was observed; and though the patient was somewhat dazed for several days, no delirium occurred. Friction, electricity, and blisters have been applied to the paralysed face, but without success.

There can be little doubt that in this case there was a fracture of the petrous portion of the temporal bone.

4. *Death by Lightning.*

On 19th June, 1893, during a severe thunderstorm, E. G., aged 31 years, a farmer's wife, was standing in the kitchen of

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her house near the fireplace, with her back turned towards it, and nursing her child in her arms. Lightning struck the chimney top, flashed down the gable, scattering stones and plaster in the kitchen and the bedroom over it, and was seen by several persons in the kitchen as a ball of fire dancing up and down for a few seconds just above the fireplace, and on a level with Mrs. G.'s head. Simultaneously with the disappearance of this electric ball, Mrs. G. fell dead; but the child in her arms sustained no injury from either the lightning or the fall. On the body of Mrs. G. no marks were discovered, except a livid bruise on the left calf and a large number of livid streaks, arranged very symmetrically, on the back of the trunk. The clothing and boots were uninjured.

The coroner did not consider it necessary to order *sectio cadaveris.*

5. *Fatal Case of Poisoning by Oxalic and Carbolic Acids.*

On 21st March, 1891, M. A. S., aged 66 years, addicted to intemperance, left her house, and twenty minutes later was discovered dead, sitting in a closet in the garden. By her side was a teacup containing three-quarters of an ounce of moist oxalic acid crystals, with a strong odour of carbolic acid. On further search, an empty three-ounce bottle labelled "carbolic acid" was found in her pocket.

The attitude of the body was one of perfect repose, the face calm and pale, the hands resting on the lap, and the clothes not disarranged. The eyes were closed and the pupils dilated. There was a strong smell of carbolic acid about the mouth, and there were brown stains on the chin and hands. The mucous membranes of the mouth and gullet were pale, shrivelled, and partially detached. The stomach and duodenum contained a greenish brown grumous matter, and the lining membranes of those organs were pale, corrugated, corroded, and easily detached, whilst the veins on their exterior surface were injected with dark blood. The brain and its membranes were congested. The heart was empty. The liver presented the well known nutmeg appearance.

6. *Poisoning by Lucifer Matches (Acute Phosphorus Poisoning).*

On 1st April, 1895, A. M. M., aged 1½ years, was discovered playing with lucifer matches, a boxful being scattered around her, and at least a dozen of these minus heads. The hands and breath smelt strongly of phosphorus, but those in charge of the infant did not suspect any danger, believing that she had merely bitten without swallowing the heads. Two and

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a half hours afterwards the child, who then seemed all right, drank a little tea, and immediately vomited, the vomited matter smelling strongly of matches. Four hours after the accident the case was brought under my notice. Large quantities of milk and magnesia were administered, and free doses of oil of turpentine. During the next thirty-six hours the stomach rejected everything; the child was drowsy and seemed to feel no pain. She did not cry once during the whole course of the illness, but asked very frequently during those thirty-six hours for milk, which she immediately vomited. On the morning of the 3rd, the vomiting ceased, and the drowsiness developed into coma, from which we were unable to rouse her, though she swallowed mechanically whenever the spoon was placed to her lips. Only for one minute did a gleam of consciousness return, when, at midnight of the 3rd, she started up to the sitting posture, said "mamma," and held the cup of milk to her lips. At 10 A.M. on the 4th, convulsions of the whole body began, lasting about ten minutes, and recurring at intervals of about two hours. She died at 10 P.M. on the 4th, eighty hours after swallowing the matches. During the last four hours she gave a deep yawn every three or four minutes, as if the little body were quite tired out. Throughout the illness the temperature remained normal, though the pulse rose to 145 on the second day, and subsequently became so rapid and feeble as to be difficult to count.

The coroner considered a *post-mortem* examination unnecessary.

TWENTY-SIX CASES OF PUERPERAL FEVER OBSERVED IN BELVIDERE HOSPITAL.[1]

By WILLIAM WATSON, M.D.

I THANK you sincerely for the honour you have done me in asking me to read this paper before you to-night. It contains notes of twenty-six cases which I had under my charge in Belvidere, and which were sent into that hospital certified puerperal fever. These cases I have arranged in groups according to the clinical features present in each, and I hope that, from the notes I am now about to submit, I will be able to make those classes quite clear to you.

[1] Read at a meeting of the Glasgow Medico-Chirurgical Society, 3rd May, 1895.

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Years of patient observation have not been able to prove the presence of a distinct specific micro-organism in puerperal fever, and now the impression is gaining ground that it is not an essential zymotic disease. Dr. Playfair, speaking of this disease, says in his book—"If any real advance is to be made, it can only be by adopting a humble attitude, by admitting that we are only on the threshold of inquiry, and by a careful observation of clinical facts without drawing from them too positive conclusions." The small number of cases I have had prevents conclusions being drawn, and it is only a record of the clinical observations I wish to place before you now.

When we read of fearful mortalities in lying-in hospitals amongst puerperal women, and of medical men passing through distracting times when childbed was to them almost synonymous with deathbed, we cannot wonder that this disease was regarded as being quite as specific as the plague, cholera, or small-pox.

But, so far, pathologists have not been able to support this view. The only organisms got are the ordinary pyogenic ones, and in most cases a distinct lesion is found on the generative organs accounting for death.

Of the 26 cases I am about to submit to you, 11 I included under the puerperal septicæmia class; 1 was a case of lacerated perinæum with bronchitis; 3 were cases of pelvic cellulitis; 5 of enteric fever; 1 of scarlet fever; 2 of pyæmia; 1 of pneumonia; 1 of puerperal mania; and 1 which died a few hours after admission had symptoms both of metritis and general peritonitis.

Of the 11 puerperal septicæmias, 7 died and 4 recovered; the 3 pelvic cellulitis cases, the case of lacerated perinæum, the scarlet fever case, and 4 of the 5 enteric fever cases recovered; while the case of mania, the 2 cases of pyæmia, and the case of pneumonia died—in all, 13 died and 13 recovered.

None of the cases admitted were in the early stages of the disease, and no case died without there being a local lesion accountable for death.

Hence I cannot speak of that class of puerperal fever cases where the patient, after a sudden, short, and severe illness, dies without any pathological change being observed.

Infective organisms of all kinds seem to reach their greatest degree of virulence where large numbers of people are gathered together. We are not sufficiently well acquainted with the life histories of the different germs yet to dogmatise, but we have fairly good proof that they seem to pass through

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different stages to the virulent until they reach a stage when their action produces death with great rapidity. In a maternity hospital, where many women are lying in the puerperal state, should a septic case occur, all round it are suitable culture media for pyogenic organisms, giving these an opportunity for completing, in a very short space of time, their cycle of life, and arriving at their stage of greatest virulence. When we draw examples from the wards of our general hospitals, and see there how much more liable a case is to become septic; when we read of the fearfully septic conditions into which military hospitals got during war, and how even the very slightly wounded died with amazing rapidity from blood-poisoning; when we look into prison statistics and see the relatively high death-rate from typhus fever or small-pox, it makes us lend our support to the view that the more rapidly an organism can pass through the various stages of its development, the greater will be its virulence.

I had lately the opportunity of making a *post-mortem* examination on a woman who died two days after child-birth from eclampsia. The uterus was 5 in. long, and its walls about 1½ in. in thickness. The cavity was filled with a large fresh clot, and the broad ligaments were free from any induration. If there is introduced into this clot before its expulsion or absorption any pyogenic organism, and if that organism is highly virulent, it is quite conceivable that death would take place before any definite pathological change occurred. In the same way, accounting for deaths in private practice, an obstetrician having anything septic about his person which he could introduce into this excellent culture medium would readily induce what is known as puerperal fever, and the termination of the disease would depend on the virulence of the organism and the constitutional resisting power of the patient. In connection with this we cannot lose sight of the autogenetic cases.

But leaving these cases, an example of which I cannot give you, and coming to those which, in my notes, I have called puerperal septicæmias, I will read what may be taken as a typical example.

M. D., æt. 23, was admitted on 20th September, in her sixth day of illness, having given birth to a six months' fœtus five days before. There was evidently no excessive bleeding, and the afterbirth was expelled all right. She had complained of abdominal pain for two days. On admission, she seemed very ill, and was very nervous and excited. The tongue was moist, but slightly coated. The abdomen was full and very tender

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in the hypogastric region. The uterus extended 2½ in. above the pubis, and its walls were soft and flabby. The os admitted the tips of two fingers, and there was an extremely putrid half-sanguineous discharge. The spleen was slightly enlarged. On the thenar and hypothenar eminences was a purplish mottling. She was at once put under chloroform by Dr. Nicol, and over a tablespoonful of placenta was scraped from the uterine wall. On the 27th it was noted that her temperature, which had each night since admission been 102·2°, was normal, and a marked general improvement had taken place in her condition. All discharges from the uterus had ceased. The uterus was very much smaller in size, the os much contracted, and the abdomen normal in appearance. Her mental condition, which had given rise to great anxiety at first, was quite clear. Pulse was good, and her strength was returning rapidly. On 1st November she was dismissed well, after being a little over five weeks in hospital.

There is a considerable similarity between that case and the following, which, unfortunately, had a fatal issue.

Mrs. B., æt. 25, was admitted on 3rd August, having been confined on 29th July—*i.e.*, her sixth day of illness. She was not long in labour, and birth seemed to be easy. Her sister, who came with her, said there was considerable, though not excessive, bleeding, and that the whole of the afterbirth did not come away. On the day following she took a shivering, and began to feel feverish. Patient on admission looked very ill. The eye was dull and heavy, and she looked pale and collapsed. Pulse was 140, bounding, soft, and compressible. Respirations were 52 per minute, and laboured, as if she were in pain. Temperature, 102·8°. The abdomen was very full and hard, and extremely tender to touch. Movement caused such pain as to make her gnash her teeth and shout in agony. She was at once put under chloroform. The uterus was found to extend to the umbilicus; the walls were dense, and the os uteri admitted the tips of two fingers. From it issued a bloody, very putrid discharge. On curetting, there was brought away a fairly large quantity of placenta from the upper left corner of the uterus. The uterus was douched with carbolic solution, and then she was returned to bed. In this case also there was the purple-looking flush on the eminences of the hands and feet. Temperature in the evening was 102°; respirations, 56; and pulse, 136. Before, and also after operation, there were general twitchings of the body like the movements of chorea, and she was slightly delirious. During

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the night she was wildly delirious, and there was some difficulty in keeping her in bed. Pulse next morning was 170, and very weak; temperature, 103·4°. The uterus was much smaller in size—2 in. below the umbilicus. She was too weak to be douched. The purple colour on hands and feet was much more distinct. She gradually sank, and, without further change, died after being about eighteen hours in the hospital. Unfortunately, a *post-mortem* examination was not granted, but there could be no doubt as to the presence of peritonitis following a metritis and parametritis.

The case of R. M. was one of great interest. She was 28 years of age, and was admitted on 9th May, having been confined seventeen days previously. Placenta was expelled three hours after birth of child. Following that, she began to shiver, and complained of pain in the abdomen and back. She had a severe headache, and was sick and vomiting. At the time of birth, and on several occasions since, she lost a great deal of blood. Discharges stopped two days ago. Temperature was 101·8°.

Patient on admission looked very ill, was markedly anæmic, and had apparently lost a great deal of blood. Her skin was a pale lemon colour. Her pulse was soft and compressible, but her tongue was moist and clean. The uterus was very large, fundus being felt 4 in. above pubis. The walls were dense, but the os uteri was not much dilated. No bleeding occurred after admission, but two days later, the uterus getting no smaller, she was curetted, and a considerable quantity of placenta was brought away.

On the 16th it was noted that her condition was not yet satisfactory, she, on the previous evening, having had a shivering. Temperature was 102°. She was not further disturbed, as she was sleeping quietly at the time.

On the 17th the following note was made:—"Patient seems to be doing fairly well. Temperature last night, 99·2°; this morning it is 97°. She is still weak, but there are signs of improvement. Bowels are loose, and there is great pain before movement."

On the following day the note reads as follows:—"Temperature keeps normal. Looks much better. Diarrhœa almost gone, and pain quite away."

On the 20th her condition was not quite so favourable. On the evening of the 18th, after the above note was made, she had a rigor, and her temperature went up to 106°. Since that time it is noted that her condition was very hopeless. Mouth was dry, and she had great difficulty in

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speaking. She was very languid, and could hardly lift her head from the pillow or move her hands.

On the morning of the 21st there was a marked improvement. She looked brighter and stronger. Speech was freer and better. Tongue was cleaner. Pulse was 92, and very much improved in quality. Temperature on the previous evening was 99·2°; on that morning 98·2°. Abdomen felt quite natural. There was a distinct systolic murmur heard at apex, and very well heard over the sternum. Diarrhœa was again troublesome.

On the 25th, the following note was made:—"This woman is now in a much more favourable state. The diarrhœa is well controlled. Temperature keeps normal, and the patient is looking much stronger."

Two days later the improvement was noted as being very pleasing. Colour was much better, and strength was quickly returning. Appetite was improving. Progress continued satisfactory, and she was ultimately dismissed well.

Mrs. M., æt. 33, was admitted on 5th January. On the 24th December she had a flooding, and next day she was confined of a six months' fœtus, after being eight hours in labour. There seemed to be considerable difficulty with the afterbirth, the midwife saying that it had grown to her side, but ultimately stating that she had got it all away. There was a great deal of discharge after the birth. She did not feel quite well from that time, but complained of no pain. On the 31st, six days after the birth, the discharges stopped. Before admission she had a rigor. There was no milk in her breasts then, but she stated that milk had been present. Temperature was 101°; pulse, 120; respirations, 28. Patient on admission seemed sharply ill. The tongue was moist, and slightly furred. Pulse was weak. The uterus was large, reaching almost to umbilicus. The os was widely dilated, and there was a faint puerperal septicæmic rash on palms. It was deemed necessary to curette, and patient was put under chloroform. The os then was found to admit the tips of two fingers. The uterus was dense and bulky, but moveable. Curette passed in for 7½ in. Previous to her getting chloroform there did not seem to be much pain on handling the uterus. There was a great deal of placenta adhering to the left posterior wall of the uterus, more than a tumblerful being removed. Next day the temperature was slightly elevated (103·4°), and she had a slight rigor. Pulse was 128, rather weak and compressible. There was very little discharge from the uterus.

On the 7th the following note was made:—"To-day an

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Name.	Age.	Complication.	No. of days since birth.	Abnormalities at Birth.	Septicæmic Rash.	Size of Uterus.	Condition of Os Uteri.	Discharges.	Presence of Placenta.	Result.
Mrs. M'K.	32	..	9	First child; severe hæmorrhage.	Present.	Very much enlarged.	Gaping.	None since admission.	Considerable quantity removed.	Well.
Mrs. M.	28	Persistent diarrhœa.	17	Placenta expelled three hours after birth.	Do.	4½ in. above pubis.	Patent.	Occasional bleeding; none for two days.	Large quantity removed.	Do.
Mrs. S.	32	Mind slightly unhinged.	4	Difficulty with placenta; expelled twenty-five minutes after birth; considerable bleeding.	Do.	Extending to umbilicus.	Widely dilated.	Bloody, putrid.	Considerable quantity removed.	Do.
Mrs. B.	25	Peritonitis.	5	Difficulty with afterbirth; considerable bleeding.	Do.	Do.	Admits tips of two fingers.	Bloody; very putrid.	Fairly large quantity.	Died.
Mrs. W.	25	Do.	4	No history of anything abnormal.	Do.	Do.	Admits one finger.	Purulent.	Large quantity in left upper corner.	Do.
M. D.	23	Mind unhinged.	5	Premature.	Do.	2½ in. above pubis.	Do.	Extremely putrid; half-sanguineous.	More than a tablespoonful.	Well.
Mrs. D.	32	Double pneumonia	10	In labour for 24 hours; no excessive bleeding; placenta small.	Do.	Extending to umbilicus.	Admits tips of two fingers.	Stopped.	A very large quantity, adhering to upper left posterior wall.	Died.
Mrs. C.	21	Do.	5	Labour lasted 24 hours; severe flooding.	Do.	Do.	Do.	Putrid.	Considerable quantity of offensive smelling.	Do.
Mrs. H.	27	Mania.	7	Apparently natural.	Do.	Do.	Do.	Do.	Large quantity removed from ant. wall.	Do.*
Mrs. M.	33	Erysipelas.	10	Severe flooding day before birth; premature.	Do.	Almost to umbilicus —7½ in.	Do.	Slight discharge.	More than a tumblerful removed from posterior wall.	Do.
Mrs. Y.	No history got.			Died an hour after admission.	Do.	To umbilicus.	Do.	Putrid.	Not curetted, but *post-mortem* revealed large quantity.	Do.

* Uterus at death normal.

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unfavourable change has come over this patient. She complained of pain in the head during the night, and a slight boggy swelling, with red edges, was noticed. This morning it has spread over the scalp, the lower border being on the brow, and leaving little doubt but that it is an erysipelatous attack. Temperature is 104·4°; pulse is 132, and poorer in quality than it was before. The uterus is smaller in size. The tongue is dry, but only slightly furred."

On the 9th it was noted that the patient was much worse. She lay in a half comatose condition, and her extremities were cold. Pulse was very poor. Suppuration had commenced in the scalp. The abdomen was much improved however, the swelling being to a great extent gone, and the uterus not much more than half the size it was. The discharge had almost ceased, but gradually the patient got worse, and on the same day died.

I was afraid I would weary you by reading the details of each case, so I have tabulated the prominent features in each of them, so that the grouping of the symptoms common to each may be simplified.

From the accompanying table, it will be seen that, with the exception of two cases, all of them presented some abnormality at birth, that abnormality having to do with the placenta. There was either delay in its expulsion, mechanical interference, or bleeding. Alongside of this statement we may place the fact that in every case there was retained placenta. In rendering the diagnosis of this easy, the contents of the four intervening columns were of great assistance. In every one of the cases there was a mottled, purplish appearance on the eminences of the hands. In some of the cases this was also seen in the corresponding areas of the feet; but the habit of going barefooted in most of the women admitted prevented this being recognisable in most of the cases. This rash bears a strong resemblance to a rash seen in diphtheria in similar situations, where there are evidences of septic intoxication from necrosing material in the throat; but it is deeper in colour and more mottled in appearance. In scarlet fever, in the palms and soles also, is seen a condition resembling this. There is, however, no mottling, and the colouration is so superficial in appearance that the parts appear to have been dipped into red ink. I had not been able to find any reference to this appearance in any writings on puerperal fever. Spergelberg mentions that erythemas are not rare. He states that only exceptionally do they start from diseased joints; usually they appear independent of them.

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A general erythema is a common thing, due to the absorption of some deleterious material. This is often seen in the early stages of small-pox, enteric fever, and measles, accounting for these diseases often being mistaken for scarlet fever. Where there is a septic wound, a general erythema may be present. But in different diseases this eruption may choose a definite seat and appear in a definite character. I need not mention the common example of erythema nodosum in rheumatism, or the rashes due to different drugs, with which you are all familiar. After the rash of scarlet fever has disappeared, if the throat continues troublesome, especially if there is necrosis, there appear bright red patches over the extensor surfaces of the limbs. It is strange that this should differ from the appearances induced by the absorption of necrosing material from the same situation in diphtheria. This rash was not present in the pelvic cellulitis cases, nor in the mamma case; and its absence from the enteric fever cases and the case of pneumonia was of great assistance in the diagnosis.

The large flabby-walled uterus—extending in almost every case to the umbilicus, and having a widely-dilated os, with, in the majority of cases, a putrid sanguineous discharge issuing from it—pointed to the presence of a foreign body in the uterus, and that foreign body in a necrosing condition.

In the cases I have read to you you may have noticed the rapid diminution in the size of the uterus after curetting, which almost proves that it is the presence of this foreign material which prevents the proper contraction of the uterus. In cases where the infection is autogenetic we are almost powerless, because the clot is at once inoculated; and though the uterus is douched out, there is a never-failing supply of pyogenic organisms.

No doubt in many cases placenta is left, and septicæmia does not follow. All that can be said is that placenta left in the uterus greatly favours the onset of septicæmia, as it acts as a source of irritation inside the uterus, and, by keeping the os dilated, renders the admission of septic material much more easy. Much has been said about the nature of the puerperal fever poison, but only the streptococcus and the staphylococcus have been discovered. Many have held that, by some peculiar unexplained means, a puerperal woman in contact with a case of infectious disease will take puerperal fever, and not the disease she is exposed to, the poison of the infectious disease being modified by the puerperal state. But surely, if we believe in the "breeding true" of the different infectious diseases, we cannot support this view. Much more likely is

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it that the septicæmia in the puerperal woman has been set up by the decomposing material in the infectious cases, because, apart from the true specific organism present, we could hardly look upon the atmosphere round them as being other than highly septic, especially in cases of scarlet fever, diphtheria, and erysipelas. The fact of Mrs. M. taking erysipelas while suffering from puerperal septicæmia proves that the poisons are not convertible, as we are sometimes told. In her case the infection was attributed to a nurse who had come to the ward she was in from the erysipelas ward. In a discussion in this Society some years ago, a gentleman stated that he had seen puerperal fever give rise to erysipelas. In both, the streptococcus is found; but if both were due to the same micro-organism, why is erysipelas not much more common in the puerperal state; why do attendants on puerperal fever cases not suffer oftener from erysipelas; why do they not take erysipelas when they are directly inoculated with the discharge, as I have known them to be; and, lastly, how is it possible for the one state to be superimposed on the other? Three cases I have separated from this list which might have been included in it. These are the two pyæmia cases and a case showing symptoms of metritis and peritonitis, but which died too soon after admission to allow of a sufficient examination. The pyæmia cases ran a course exactly similar to the other cases until, shortly before death, local abscesses occurred in different situations.

Mrs. M'F., æt. 35, was admitted six days after birth of her child. In the doctor's opinion it had been dead for about nine days. There was a great deal of bleeding, and the afterbirth came away almost at once.

The patient looked very ill. The mouth was dry, and there were sordes on the lips and gums. The tongue was coated and dry. The abdomen was full, the uterus being within an inch of the umbilicus. The os was widely dilated, admitting the tips of two fingers, and from it was a hæmorrhagic discharge. Temperature was 103·6°. On curetting, a large quantity of placenta was brought away. She passed a good night. Next morning pulse was 124, and temperature 103·4°. That night temperature was 105·6°, and the pulse 140. On the 24th it was noted that her condition was gradually getting more hopeless. The localised swellings on the fore-arms, which had appeared on the 21st, were deeper in colour and painful, but not fluctuant. The eminences of the palms of hands had a deep, livid flush, but this was accompanied by no swelling. Small abscesses appeared in different parts of the body, the breathing got

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very difficult, and she gradually sank and died on the 26th. Hence, beyond the appearance in the late stage of localised abscesses, there is is nothing, either in the history or symptoms of this case, to dissociate it from the other class.

As regards treatment, many advocate that curetting should be held as a last resort, but considering the difficulty of thorough douching, and the soft, friable, spongy nature of the tissue we are dealing with, curetting would seem to be indicated at the very commencement. In fact, what appear to be good guides in the treatment of such cases are the following:—

If there has been a great deal of bleeding at birth, we may justly suspect the presence of some foreign body in the uterus. This may be a piece of adherent placenta, or some membrane which has become detached and is retained, and which is interfering with the proper post-partum contraction of the uterus. By using at once a douche curette with some hot antiseptic solution, this could be at once removed and proper contractions established. Should there be no more than normal bleeding, but the uterus remain large and walls flabby for some days, we should at once anticipate the onset of septic symptoms, and take suitable precautions.

Whenever there has been much manual interference, or instruments have been used, the uterus should be thoroughly douched out antiseptically.

Three of the cases were regarded as being pelvic cellulitis. We might as well deny that a cellulitis in the neck associated with a bad throat had no connection with that, as that there is no connection between a metritis and a pelvic cellulitis. From the anatomical structure, if there is a metritis associated with decomposing material in the cavity of the uterus, it follows that there must be a certain amount of parametritis; but in the three cases under consideration, the uterus appeared almost normal.

I think there can be no doubt that a wide gap separates such a case as this from the ones I have previously given.

Mrs. M., æt. 23, was confined twenty-six days ago. It was a cross birth, and instruments were used. The placenta came away immediately afterwards, and was evidently all right. Two days later she complained of abdominal pain, and was feverish. Temperature was 103°; pulse, 112, compressible and thready; respiration, 32.

On admission patient seemed very ill. The face was pale and studded with beads of perspiration. The tongue was moist and furred. The eye was clear and the pupils were dilated.

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The lungs and heart were normal. The abdomen was much distended and tender, and in the right lumbar region there was a large, bulging, painful mass. Between the pubis and the umbilicus the abdomen was tense to the touch, was dull to percussion, and very painful. The measurements were:—

Round abdomen at umbilicus,	29½	inches.
Umbilicus to left iliac crest,	7	,,
Umbilicus to right iliac crest,	6¼	,,
Umbilicus to ensiform cartilage,	7	,,
Umbilicus to pubis,	6½	,,

She could not lie on her back on account of the pain, and was most comfortable when lying on her left side. On per vaginam examination, the os uteri admitted the tip of the fore-finger. The uterus was buried in a dense, immoveable mass, and admitted a gum elastic catheter for 5½ in. There was a slight yellow discharge, but it was not bad smelling. Urine contained a small quantity of albumen. The breasts were not developed. Three days later the pain was very much less. Patient seemed stronger, and the tongue was clean and moist. On 3rd November the following note was made:—"The improvement in this woman's condition to-day is very marked. Both the pain and fulness are almost entirely gone. She can lie easily in any position, and turns now without pain. Diarrhœa is now giving some trouble. The circular measurement was less by 3¾ in.; from the umbilicus to the left iliac crest, by ¾ in.; to the right, by 1 in.; to the ensiform cartilage, by 1 in.; and to the pubes, by 1 in." On 7th November, there was still a slight tenseness in the abdomen. The uterus had contracted in size, and the os was no longer patent. Unfortunately, before going she took enteric fever, but was dismissed well on 31st December.

One of the other cases corresponded almost exactly with this one in every particular, but her stay in bed was of great length, as, every time she attempted to rise, the pain and swelling returned to the iliac region. The third case was admitted twelve days after the birth of child, which was easy and natural. Three days following that she sprang suddenly out of a high bed, and two hours later was seized with severe pains in the lower part of the belly. She had a distinct painful mass in left iliac fossa. In none of the cases did suppuration follow, and beyond the presence of diarrhœa—which was also a troublesome feature in first case—this patient made a satisfactory recovery.

In these cases, no rash was present, and from the condition

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of the uterus one felt sure of the absence of membrane or placenta. Two of them had a distinct history of injury. The third was a primipara, but if it is true, as Lund asserts, that straining at stool can cause pelvic cellulitis, surely the severe straining at parturition is a much more probable cause of injury. From the arrangement of lymphatics, if there was a breach of surface and the absorption of putrid material from the lower part of the generative tract, we would expect a pelvic cellulitis with little or no interference with the uterus, provided that the clot there did not become inoculated. But I think it might be also readily accepted that we have cases of pelvic cellulitis due merely to the mechanical injury of the cellular tissue, and not due either to the direct action of micro-organisms or to the spreading of the inflammation around an enlarged pelvic gland.

A VISIT TO GARCHES WITH DR. ROUX.[1]

BY R. COWAN LEES, M.B., C.M.

AT the request of Dr. Chalmers and one or two other medical brethren, I consented to give a short account of a visit to Garches Farm, which is a part of the Pasteur Institute, and where Dr. Roux has carried through his many experiments upon horses, in connection with the production of diphtheritic antitoxin.

Dr. Chalmers was kind enough to send me, whilst I was on the Continent, a letter of introduction to Dr. Roux, and it is needless to say that such a letter caused me to be received with every mark of kindness and courtesy.

A call was made at the Pasteur Institute in Paris, on Saturday morning, 6th April, and immediately I was conducted to Dr. Roux's private laboratory, where I presented my letter of introduction, in which Dr. Chalmers stated the object of my visit. Dr. Roux then enquired which department I was most desirous of seeing, and added that the horses, of course, were the most interesting. I readily coincided with this view, and quietly enquired if I might be so highly favoured as to see the horses, because I was under the impression that a good deal of secrecy was maintained, but the doctor, immediately on receiving my request to see them, wrote on a

[1] Read at a meeting of the Glasgow Medico-Chirurgical Society on 10th May, 1895.

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card that I should leave by the 9·10 train from St. Lazare station on Monday morning for Garches, and he would be very pleased to show me over the farm.

On Monday morning I left by train at the time mentioned, and arrived at Garches in about half an hour, where I was pleased indeed to see Dr. Roux awaiting my arrival. We walked together to the farm, a place which might be looked upon in this country as an old country-house, surrounded by a high stone wall, entrance being gained by a gate which apparently was kept locked.

On walking along the avenue from the gate to the house, the first sight which attracted one's attention was the numerous cage-like compartments along the gable of the house towards the sun, with hundreds of guinea-pigs all peeping out between the wires. No notice was taken of them, as my mind was entirely bent, for the time being, on seeing the horses. Within a few minutes we reached the courtyard, and, entering a stable, found it fitted up on the same lines as any of the large stables in Glasgow, as open as possible, so as to ensure free ventilation. Above the stall of each horse was its number, the date when it entered the farm, and when it was first injected with toxin.

Dr. Roux pointed out to me a number of favourite horses, some of them having in former days occupied places of distinction in carrying some famous gentleman or noted dame of Society, and he also made me examine the cicatrices of past punctures. These presented the character of small nodules of firm connective tissue. They were not tender, and there was no infiltration of the tissues, although very many punctures had been made nearly in the same place. I may here mention that I saw a horse which Dr. Roux told me had been bled "many hundred times."

After looking over nearly all of the eighty horses which Dr. Roux has in the farm of Garches, he conducted me into a compartment which might be called the operating room, and where the veterinary surgeon was engaged upon the various necessary operations prior to the drawing of the blood from the horses. The method of bleeding the horses is very simple, and may be described in a few words:—

A horse is led into the operating room, and a twitch is applied to its upper lip, which precaution is only adopted in order to keep the horse steady while the incision is being made, and the trocar and canula entered. The position selected for inserting the trocar and canula is at the most superficial part of the jugular vein, and is carefully cleansed

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with a solution of bichloride of mercury. The veterinary surgeon then makes a small incision through the skin, about a half to three-quarters of an inch in length, in the longitudinal axis of the vein, and through this he passes the trocar and canula into the vein. A separate trocar and canula, thoroughly sterilised and taken from a large test-tube, is used fresh for each horse, and, this being passed into the jugular vein, a rubber tube, which is used in common for all the horses, is passed over the head of the canula. This rubber tube has, at the other end of it, a long nozzle of what appeared to be celluloid, and this was passed through a hole in the sterilised tin cover, and forcibly pushed through the sterilised paper cover of the glass vessel into which the blood flowed. Each glass vessel, when filled, would contain about 6 litres, but, in every case operated upon whilst I was present, one of these vessels and about the half of another were filled with blood, making a total of about 9 or 10 litres from each horse.

It may be mentioned that, whenever the trocar and canula were passed into the jugular vein, the twitch was removed from the horse's lip, and he was then given some turnips and carrots to eat, whilst the blood was being withdrawn. When the desired amount of blood was extracted, the canula was taken away, and over the small wound one of the assistants placed a pledget of cotton soaked in a solution of bichloride of mercury and covered with gutta percha tissue, while the whole was held in position by strips of adhesive rubber-plaster, and the horse was then led away to his stall.

The animals did not seem to be affected in the slightest degree by the loss of so much blood, for they seemed quite as spirited and active in their movements after the operation as before.

On inquiring at the veterinary surgeon whether he ever had had a case showing evidences of weakness afterwards, he assured me that he had never seen anything approaching to it, even in cases where he had extracted as many as 15 litres.

I was informed that each vessel for the reception of the blood was thoroughly sterilised by dry heat, and was brought into the operating room with two paper covers over its mouth. These were made of ordinary newspaper, and were browned by heat. A tin cover was brought in separately, also wrapped in newspaper, direct from the steriliser. When about to be used, one of the paper covers of the glass vessel was lifted off; the tin cover was then stripped of its paper, and placed over the mouth of the glass vessel on top of the single newspaper cover. This tin cover was perforated on

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the top with a small round hole about the size of a shilling, and through this and the paper beneath the celluloid nozzle was passed. When the vessel was filled, the tin cover was removed, and the second sterilised paper cover, which had been laid aside, was now replaced, and the vessel set aside.

Everything was as carefully prepared as possible in the endeavour to keep the blood thoroughly aseptic. [Samples shown of apparatus employed.] Every man present seemed to have his own particular duty assigned to him, and each one did his part both methodically and silently. One man took those 6-litre vessels filled with blood, and, placing them on a tray, carried them from the operating room into another compartment, to which we followed him.

On leaving the operating room we passed through one of the stables into the open courtyard, and, ascending a staircase, entered a room where large numbers of jars filled with blood were laid upon tables, all of which were in different stages of coagulation. This room was kept at a constant temperature of 20° C., equal to about 68° F.; and the reason of this temperature, Dr. Roux stated, was to enable precipitation and coagulation to proceed slowly. A few days was all that was necessary for the complete separation of the serum, when it was carefully syphoned off into a large vessel. The serums from the different horses were now mixed together in this large vessel, and here, again, a short time was allowed to elapse, so that any clots or solid particles which had escaped into the larger vessel might deposit.

From this room we passed into a larger room, where a girl and a boy were busily engaged cleansing and sterilising the small flagons which were to be filled with serum, and another girl was busily engaged filling the small flagons from one of the large vessels containing the combined serums. These small flagons were filled by a measuring apparatus completely made of glass, and were quickly corked and covered in the manner in which you see the samples before you. The whole process seemed to me so very simple that, with ordinary precautions, any one might safely carry it through with very little anxiety.

Up to the present I have only described that which I saw; and as no mention has yet been made of the immunising of the horses, I shall give you, in as few words as possible, the information which I received from Dr. Roux on the matter.

Even at the risk of conveying information which may be well known to those present, I may with advantage describe how bouillon or broth is prepared suitable for the making of

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the toxin with which the horses are injected for the purpose of immunisation against diphtheria.

Five hundred grammes (say, 1 lb. avoirdupois) of lean beef is selected and finely chopped. This is placed in a flask, to which 1 litre of pure water is added, and the whole is laid aside for twelve hours, being occasionally well shaken. After that time has elapsed the fluid is properly strained, and the meat left in the straining cloth is well squeezed, so as to extract all the fluid. The quantity filtered should measure 1 litre. This meat-water is now cooked, but, before cooking it, ten parts of peptone powder and five parts of common salt must be added to every thousand parts of the fluid, in order to prevent complete coagulation of the albumen. The cooking is carried through in a steam-chest or water-bath for three-quarters of an hour.

The broth should now be made as nearly neutral as possible by the addition, drop by drop, of a saturated solution of carbonate of soda. The broth is again cooked for one hour and filtered when it is cold, and it should then be free from all cloudiness.

The diphtheria bacillus is now added to a quantity of this sterilised broth, and placed in a chamber which has a temperature of 37° C. As the diphtheria bacillus belongs to that division called aërobic, it has been found a great advantage to use a flask which allows a constant current of air to pass over the surface of the inoculated broth. About three weeks suffices for the production of the greatest amount of toxin derived from the bacilli, and, curious to say, a longer time does not produce more.

The broth, or, let us now call it the culture-fluid, is filtered by means of a Pasteur-Chamberland filter, in order that all bacilli may be entirely excluded from the fluid which passes through. It will now be seen that the fluid contains the product of the bacillus-diphtheriæ, together with a small portion of peptone and other extractive matter. This is the fluid which is now used as injections for the purpose of immunising the horses. No bacilli are injected, but simply the resulting culture-fluid after a complete filtration. I would not have mentioned this were it not for the fact that, in the *Glasgow Herald* the other day, there appeared a notice about diphtheritic serum, in which a worthy member of our profession is represented to have stated that it was a weak solution of the diphtheritic membrane, taken from a child's throat, that was used as the injection for the horse for immunising purposes; but this, you will understand, cannot be the case.

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It may be mentioned that a small quantity of a solution of iodine is added to the culture-fluid before it is used upon the horse. To begin with, about 1 c.c. is injected into the shoulder of the animal, and this amount is gradually increased, whilst the quantity of iodine in the fluid is lessened. The horse is injected three times a week for three weeks, and then he is allowed to stand for a period of two or three months. Dr. Roux mentioned that at the end of the three weeks the blood might be drawn from the horse, and the serum be found perfectly active. Some mild antiseptic is generally added to the serum before it is bottled.

I hoped to have been able to show you a chart wherein a bird's-eye view would be given of the number and dates of the toxin injections, with the temperatures observed after each, but, unfortunately, time did not permit of such being secured.

In concluding these reminiscences of my visit to Garches, I may say to you that I was impressed by the great simplicity of the whole process from beginning to end. I should like to take this opportunity of publicly acknowledging Dr. Roux's extreme kindness and courtesy on the occasion of my visit.

CURRENT TOPICS.

THE COLLEGE OF PHYSICIANS, PHILADELPHIA.—The William F. Jenks Memorial Prize of 500 dols., under the deed of trust of Mrs. William F. Jenks, has been awarded to A. Brothers, M.D., 162 Madison Street, New York, for the best essay on "Infant Mortality during Labour, and its Prevention." The Prize Committee also reports as highly meritorious the essay on the same subject bearing the motto, "Vade Mecum." The writers of the unsuccessful essays can have them returned to any address they may name, by sending it and the motto which distinguished the essay to the Chairman of the Prize Committee, Horace Y. Evans, M.D., College of Physicians, Philadelphia.

VACANT CHAIR OF PATHOLOGY. — We are informed by J. C. Wilson, 1,437 Walnut Street, Philadelphia, Pa., that the Chair of Pathology in the Faculty of the Jefferson Medical College in Philadelphia is vacant.

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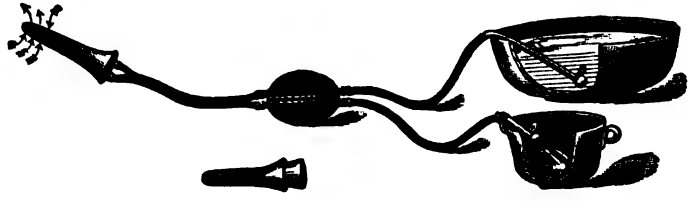
THE following is the list of succesful candidates, in their order of merit, at the recent examination in London for Commissions in the Medical Staff of Her Majesty's Army:—F. S. Brereton, J. C. B. Statham, P. J. Probyn, R. M. C. H. Cooper, A. H. Waring, M. L. M. Vaudin, W. A. Ward, E. G. Forrest, A. W. Hooper, and E. C. Hayes.

THE FRENCH SURGICAL ASSOCIATION.—The ninth Congress of the Association Française de Chirurgie will meet at Paris in the Faculty of Medicine, on Monday, 21st October, 1895, under the presidency of Dr. Eugène Bœckel. The inaugual meeting will take place at 2 o'clock, and two subjects for discussion have been placed on the programme of the Congress: (1) "The Surgery of the Lungs (Pleura excepted)," introduced by M. Reclus; (2) "The Early or Late Operative Intervention in Solutions of Continuity of Bone (the Cranium and Rickets excepted)," introduced by M. Heydenreich. All communications concerning the Congress to be sent to M. L. Picqué, Secretary-General.

NEW DRUGS, PREPARATIONS, INSTRUMENTS, &C. — From *Messrs. Oppenheimer, Son & Co., Limited,* we have received specimens of palatinoids of thyroid gland and bipalatinoids of Fehling's test for sugar in the urine. For the former, it is claimed that the inclosure of the thyroid powder in a capsule tends to their preservation; for the latter, it is urged that they constitute a very suitable form for the general practitioner keeping Fehling's test always at hand and ready for use. All that is necessary is to place one of the capsules in the urine to be tested, and to boil it.

Messrs. J. C. Ingram & Son, of Hackney Wick, London, have sent us a specimen of the "Vonda" Ladies' Syringe, of which we give an illustration, and which is an alternate



douche and suction syringe. "It can be used while lying in bed without getting a drop of water on the bed clothes," a circumstance which is bound to recommend it to the general practitioner.

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HER Royal Highness Princess Christian has accepted the dedication of a new novel, entitled *Perfect Womanhood*, from the pen of Mr. James Frederick Gant, F.R.C.S., the author of many stories and of a work on surgery.

CORRESPONDENCE.

THE BOARD OF TRADE AND SEAMEN'S EYESIGHT.

To the Editors of the "Glasgow Medical Journal."

GENTLEMEN,—I am obliged to you for sending to me the cutting from the *Liverpool Journal of Commerce*, of 23rd August, 1895, forwarded to the *Glasgow Medical Journal*, containing a sound, if somewhat severe, criticism of the position assumed by Mr. Bickerton at the last meeting of the British Medical Association. In answer to your request that I would give the readers of the *Glasgow Medical Journal* my views on the subject, I have to state that, in the main, I would rather not. This feeling arises from the fact that any opinion I may have formed is perhaps of little interest to medical readers in general; and that, moreover, I am at present giving expression to what I believe to be truth in the matter in the Transactions of one of our scientific societies. As you have honoured me by making this request, I write out the following summary of the paper referred to. The paper itself will be issued in the course of a few days, and will then be forwarded to the members of the Board of Trade and to a few experts.

Let me say that I entirely deprecate the discussion of this most important question in the lay press. The editors of the *Herald* and *Mail* most courteously suppressed, at my request, all report of the meeting at which my said paper was read. To some extent the *Glasgow Medical Journal* is in this matter *lay press*, and therefore I would rather not make any communication to it. You must, therefore, exercise your editorial discretion, and if you share my own opinion that little good is likely to be obtained by your publication of this, then kindly refrain from inserting it.

To begin with, allowing that 4 per cent of men are colour-blind, then it is obvious that before the Board of Trade instituted colour-tests that 4 per cent of vessels must have been navigated by colour-blind persons. If colour-blindness

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is a danger to navigation, such a state of matters should have led to a huge percentage of losses every year. There is no record of disaster at all corresponding with the fact. If the cases of colour-blind collision are so common as Mr. Bickerton believes, surely no difficulty would be experienced in quoting a hundred cases or so. The very few instances that have been given are, for the most part, most inconclusively proved, and entirely disputed by many undoubted authorities. The danger from alcohol is infinitely greater than from colour-blindness, but so far the Board of Trade have not insisted on men, to whom they grant certificates, being total abstainers.

But, again, the vast majority of colour-blind persons can distinguish perfectly well between a port (red) and starboard (green) light. There are doubtless a few who cannot, and they are certainly dangerous. Lately I have examined two seamen; both of them have been for years at sea without ever mistaking a light; both have passed the old tests; both were applying for higher grade certificates; and yet, because in one case green is confused with grey and in the other with buff, they were both sent on shore, and their careers, after many years of arduous toil, completely ruined. These men, although most carefully tested, never confused green with any shade of red, nor red with any other colour. Therefore they were both perfectly safe for navigation duties, and ought not to have been refused certificates. The very fact that both these men had been navigating officers for several years without any collision or accident speaks volumes. These are specially hard cases—the Board of Trade examined them for colour some years ago and passed them. Believing that the examination was accurate, they pursued their calling. Under the new tests they fail to pass, and are thus ruined by no fault of their own, but by the caprice of the Board of Trade. Surely they should be compensated.

To show to what an extent the craze for colour-testing has gone, it may be mentioned that in certain sea employments the engineers and firemen are examined. It were well to make sure that the persons on whom the ultimate interpretation of lights depends—namely, the various officers of the watches—should be accurately tested, but it is superfluous to test the colour sense of any other man on board.

Limits of space prevent the discussion of the question as to how the majority of colour-blind persons can distinguish between a port and starboard light. In the report of the Royal Society (*Proceedings of Royal Society*, vol. li, No. 311) diagrams are given representing the manner in which the

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colour-blind see the spectrum. These illustrations are purely theoretical, and are based on the Young-Helmholtz theory, which we believe to be erroneous. The diagrams must either be inaccurate, or else they are the best possible proof that colour-blind persons can distinguish between a port and starboard light. For, take any portion of any one of these spectra from the left hand side of the neutral line, and compare it with the right hand side of the same spectrum from which it is taken, no match for the portion will be found. Now, both the port and starboard lights are taken from opposite sides of the neutral line (the existence of which I also doubt), and therefore, if these drawings are true, these lights must give to the colour-blind two totally distinct sensations.

The practical question is simply this—Can a man accurately, and without hesitation, tell a port from a starboard light? If he can he is fit to take command of a vessel, although he may utterly fail to arrange what, for want of a better name, may be called the scale of colour as is now required. To state an analogy, many a man can tell a high from a low note, although he cannot say if a violin is in tune. If an officer cannot tell one light from the other, then he ought not to be allowed to be the officer of a watch or commander, although he is fit for every other duty on board, at least, as these duties are performed at present. Most colour-blind persons can tell a port from a starboard light perfectly, and are not dangerous.

Apologising for the length of this communication, I remain, yours faithfully,

F. FERGUS.

MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING XI.—3RD MAY, 1895.

I.—CASE OF TUBAL PREGNANCY IN WHICH OPERATION WAS OBSTRUCTED BY AN OVARIAN TUMOUR.

BY DR. T. K. DALZIEL.

Dr. Dalziel read an account of this case, which will appear as an original article in a future number.

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II.—TWENTY-SIX CASES OF PUERPERAL FEVER OBSERVED IN BELVIDERE HOSPITAL.

By Dr. Watson.

Dr. Watson's paper will be found as an original article at p. 268.

Meeting XII.—10th May, 1895.

The President, Dr. Hector C. Cameron, *in the Chair.*

I.—FRESH SPECIMEN; RECURRENT FIBROID.

By Dr. Knox.

In showing this specimen, Dr. Knox said that it was a very interesting one from various points of view. It was, so far as he had seen, one of the most typical forms of what Paget had called the "recurrent fibroid."

The history of the case was much as follows:—W. A., aged 43 years, had been admitted to Dr. Knox's wards in the Royal Infirmary on 29th April. He had then a very large and extensive mass of tumours over the anterior abdominal wall. The tumours were very irregular in shape, and situated around, though not involving, the umbilicus, and over both sides of a scar, about 3 inches in length, which ran from below the umbilicus to the right flank, and was evidence of an operation which had been performed in the Western Infirmary fourteen years before. The patient could not say in what ward or by whom that operation had been performed; but Dr. Knox thought that probably the publicity now given to the case would elicit information on that point.

On examination, it had, further, been found that there were four separate tumours of considerable size, and that the tissue in the intervening space was much thickened by being infiltrated with smaller nodules. The superfices of the part involved would measure about 8 inches in diameter. The skin over most of the growths was purple in colour; but over one nodule it was noticed to be quite normal, except at a point where it appeared that the tumour was about to burst through. The large one to the right side was fungating, and exuded a very foul discharge. Another was beginning to fungate. The whole mass of tumours, on being grasped, had

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been easily raised from the abdominal wall, so that Dr. Knox had concluded that it was in the cellular tissue.

As a considerable hæmorrhage had taken place from the fungating part two days ago, the whole mass had been removed, and was now shown. Many large vessels had required to be ligatured in the course of the operation. The bare surface left had been partly filled by turning in portions of the surrounding skin.

After the first operation, fourteen years ago, there had been an interval of two years before recurrence had been noticed to begin; but growth had been very slow till quite lately, and patient had been at work until within a week of admission to hospital. He had had no severe symptoms until quite recently, when growth had become accelerated. It was probably the friction of the clothes that had determined the ulceration.

The tumours were probably malignant, although at first sight the slowness of growth and the rounded, well-defined nature of the tumours seemed rather against that view. But, on the other hand, there was the colour of the skin, there was the presence of the smaller nodules between and around the larger ones, and there was the fact that the part was fungating. These points Dr. Knox held to point to malignancy—"local malignancy," as Paget called it—and it seems best to place the case in the category which he had described as including tumours tending to local recurrence, though not to infection of the body generally.

Dr. Knox had not examined the tumours histologically, but he would expect to find the structure of spindle-celled sarcoma.

Dr. Hector Cameron mentioned having shown a similar specimen to the Society some years ago. The details of his case will be found in the *Glasgow Medical Journal*, 1889, vol. i, p. 148. Paget's name for such tumours had, he thought, been previously used by Sime.

II.—PAPER DESCRIBING A RECENT VISIT, WITH DR. ROUX, TO GARCHES (THE FARM IN CONNECTION WITH THE "PASTEUR INSTITUTE").

By Dr. R. Cowan Lees.

Dr. Lees read this paper, which is published as an original article at p. 280, and showed specimens illustrative of the apparatus, &c., which he had seen employed at Garches.

Dr. Hector Cameron understood that, in institutions such as Dr. Lees had described, before a horse was used, injection

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of mallein was employed to determine the presence or absence of glanders. He would ask if Dr. Lees had seen that done. Great importance seemed to be attached to it, especially in France, and the practice was in vogue at the British Institute of Preventive Medicine.

Dr. Lees said that he had not seen mallein used, but he had been told at Garches that they always tested the horses with it. In reply to Dr. Cameron, he added that the filter he had mentioned in his paper must be one of porcelain.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

SESSION 1894-95.

MEETING VII.—8TH APRIL, 1895.

DR. D. N. KNOX *in the Chair.*

I.—STRANGULATED FEMORAL HERNIA; GANGRENE; RUPTURE; RESECTION; CURE.

BY DR. NEWMAN.

A report of this case will be found as an original article in the August number, at p. 85.

II.—PATIENT WITH PERNICIOUS ANÆMIA AND ACUTE INTESTINAL OBSTRUCTION FROM CONTRACTION OF OLD FIBROUS ADHESIONS; LAPAROTOMY; RELIEF OF OBSTRUCTION; CURE.

BY DR. NEWMAN.

Dr. Newman showed this patient, and gave the following account of the case:—

A. M'F., aged 43 years, admitted under my care in the Royal Infirmary on the 25th January, 1895, presented the characteristic symptoms of acute intestinal obstruction.

According to the history given by the patient, he was suddenly attacked with severe pain in the abdomen on the morning of the 22nd of January. More or less pain was constantly present since the onset; but occasionally severe paroxysms occurred, and these were colicky in character. Frequently these pains were initiated in the region of the umbilicus—*i. e.*, in the region of the solar plexus. From the

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region of the umbilicus, the paroxysms of pain rapidly spread downwards to the left inguinal region; and, as a rule, these pains lasted for from three to five minutes.

Three hours after the onset of the pain, vomiting—at first occasional, afterwards persistent—set in. At first the vomited matter consisted only of the contents of the stomach; but before the patient was admitted into the ward, it was distinctly stercoraceous, and feculent in odour. There was no movement of the bowels from the 22nd inst. On admission, a large enema was administered without producing any effect.

Physical examination of the abdomen showed the great bulk of the intestine to be entirely empty, while there was a distinct dull area round the umbilicus, and extending downwards and towards the left groin. This area, also, on palpation, conveyed the sense of increased resistance, but not of tumour.

Taking all the facts of the case into consideration, the conclusion arrived at was that the patient was suffering from complete intestinal obstruction; and it was resolved to perform laparotomy at once. The patient was put under chloroform, and an incision was made in the middle line, between the umbilicus and the pubes, large enough to admit the hand into the abdomen. On exploring the intestine, about 4 feet of the middle portion of the ileum was found to be firmly bound down by strong fibrous adhesions. These adhesions fixed the gut to the posterior abdominal wall, and also united the free margins of the bowel to neighbouring folds of intestine. Above the uppermost point of obstruction, the small intestine was considerably distended with gas; but below that point the bowel was completely collapsed.

After freeing all the adhesions that could be found, the whole length of the small intestine was carefully examined from the caput cæcum upwards. The abdomen was then washed out carefully with a warm solution of boracic acid, and the wound closed in the usual way.

Previous to the operation the patient was in a state of extreme collapse; the pulse 100 per minute, small, thready, and irregular; the temperature 97° F.

While the operation was in progress artificial respiration required to be performed, and ether administered subcutaneously. I visited the patient in the evening, and found that duriug the day he had improved greatly. The pulse in the evening was 106 and the temperature 98° F. The character of the pulse was much better, fuller, not so compressible, and regular.

Vomiting occurred after the patient came out of the

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chloroform; but after 3·30 P.M. he was only sick once, and that after taking a teaspoonful of whisky with soda water.

On the morning of the 26th the nurse made the following note:—"Patient slept very well all night, had whisky (a teaspoonful) every hour, and milk at intervals. Has not been sick since 10·30 P.M. till half-past 5 A.M., but commenced to be sick then, and has not had milk or whisky since."

It is not necessary to enter into the details of the recovery of this case, further than to say that the patient was well within ten days of the operation. The bowels were freely moved on the 28th, that is to say three days after the operation, and again three times on the 29th. The temperature, during the whole course of the case, did not rise above normal, the patient's temperature being naturally slightly subnormal.

Apart from the surgical aspects of this case, a point of considerable medical interest may be mentioned. Last summer (1894) this patient was under the care of my colleague, Dr. George S. Middleton, who treated him for pernicious anæmia, but I see Dr. Middleton is here; he will, no doubt, speak to the facts as observed by him.

While the patient was in my ward, the blood was carefully examined by Dr. Middleton, who found, on the 10th February, that it contained 80 per cent of hæmoglobin, and 44 per cent of red blood corpuscles, whereas, on the 15th March, the hæmoglobin had increased to 96 per cent, and the corpuscles to 102 per cent. Whether or not the relief of the intestinal obstruction had anything to do with this remarkable change in the condition of the blood, I am not prepared to say; but, at all events, it must be admitted as rather a remarkable coincidence that so much improvement should have taken place after the operation.

The success of this case teaches an important lesson—viz., that immediate action on the part of the surgeon is demanded in many cases of acute intestinal obstruction. I would almost contend that, in the majority of cases where there is a strong presumption in favour of the diagnosis of acute intestinal obstruction, a surgeon is justified in performing laparotomy even before he is able to pronounce positively what the nature of the disease is. In other words, he is justified in opening the abdomen for diagnostic purposes in such cases.

If this case had been left for other twelve or twenty-four hours without operation, the upper portion of the bowel would have become so distended that it would have led to rupture or gangrene at the point of constriction; but by relieving the

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obstruction at an early stage the life of the bowel was saved, and the patient thereby made a rapid and satisfactory recovery.

III.—KIDNEY SUCCESSFULLY REMOVED BY LUMBAR NEPHRECTOMY.

BY DR. BEATSON.

This specimen of excised kidney was successfully removed on 24th June, 1894, from a female patient, aged 36, by lumbar nephrectomy, the operation of nephrotomy having previously been performed on it some seven years previously—viz., 26th July, 1887.

I have brought it before the Society to-night, because I think the case is both interesting and instructive. For myself, I feel that while the case, from first to last, has given me plenty of food for thought, to say nothing of anxiety, I have learnt from it a good deal.

I shall very briefly sketch in outline the leading facts of its clinical history.

It was in November, 1885, she first consulted me, and the symptom for which she sought advice was *bladder irritation*, as shown by painful and frequent micturition. She gave three years as the duration of her illness.

At her first visit she had not the appearance of ill health. She was thin and rather fresh coloured, and had been able for her duties in domestic service. She had, indeed, always enjoyed fairly good health.

She came of a family, however, that showed signs of tubercle, one sister having died of decline, and her father of an abscess of liver. Her mother, then alive, has since died of carcinoma uteri.

On questioning her, I elicited that the first symptom she complained of was *sudden pain in the bladder*, which was followed by *pain* during the act of micturition.

At that time urine was examined by the late Dr. Taylor of Port Glasgow, and found normal.

Gradually, however, the urine began to show signs of excess of mucus, followed by the presence of blood and deposit, and this was its condition when I saw her in November, 1886. Examination of the urine showed it to be acid, that it contained albumen, and was loaded with pus. The microscope showed abundance of pus corpuscles, epithelial cells from the bladder and kidney, and red blood corpuscles.

The opinion I formed of the case was that we had a tubercular condition of the kidneys to deal with, and that

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the vesical symptoms were merely symptomatic of the more serious and higher placed lesion. There was, however, nothing to indicate whether one or both kidneys were involved, and if one, which one.

I confess at that time my idea of tubercle in the kidney was much that of tubercle of the lungs, that, if in one, probably in both, and that the treatment was that of tubercle generally.

I advised hospital treatment, but she would not consent, so gave her iron, cod liver oil, &c. In a letter to me she says:—"After I first went to you for advice, I got on fairly well for eighteen months."

This brings us to the summer of 1887, when she went to Crieff, and there she became much worse. The bladder symptoms were more intense, and in addition two new symptoms appeared—viz., *pain in the left side and rigors.* She was seen by Dr. Thom of Crieff, who sent her down to Glasgow, and I arranged for her admission to the Western Infirmary, where she was admitted on 15th July, 1887.

Dr. Gemmell was on duty in Ward VI, into which she was admitted, and I saw her with him. She was very weak and very emaciated, and she had all the symptoms of *suppurative fever*—viz., shiverings, high temperature, and sweatings, and as there was some prominence of left flank, with, on palpation, the existence of a distinct hard and tender swelling between crest of ilium and false ribs, the conclusion arrived at was that we had to deal with a renal abscess. She was accordingly removed to Sir George Macleod's wards, where I was on duty, and on 26th July I performed nephrotomy.

She left on 24th October, 1887, as the report says, "almost well." This was, perhaps, too rosy a view of the case, but without going into details, I may say that with time a great improvement took place, the bladder symptoms subsided, her general health improved, and she was able for service as a lady's maid.

The wound did not completely close—there was always a sinus with urine coming from it, but as she was going on so well she was loath to have anything done, and I could not urge it, as the urine was free from pus and albumen. I was very pleased with the result, and the conclusion forced itself on me that we had had to deal with a limited tubercular renal abscess.

In May, 1894, she came to see me, and she was looking ill. She told me that she had return of pain in the left groin and was feeling very ill. The pain was followed by rigors

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occasionally and high temperature. Under rest and warmth some amelioration of symptoms took place, but a very distinct swelling was again to be felt in left flank. Urine, however, showed no pus, and I came to the conclusion that there was more suppuration in the kidney, and that either the ureter was blocked or it was in a fresh position of the kidney, and might possibly have burst through the capsule and become perinephritic. As she was evidently getting worse, and as the urine was satisfactory, I determined to excise the kidney, which was done on 24th June, 1894.

The following is Dr. R. M. Buchanan's pathological report on the case:—"The specimen, which has been preserved in spirit, appears as a somewhat ovoid, indefinite mass, with a ragged surface layer of fibrous tissue. It measures 3 inches by 2½ inches by 2 inches. On section it presents a thick irregular rind of adipose tissue, and an ill-defined central white fibrous tissue merging at one side into some reddish tissue recognisable as kidney. In the whiter central tissue are several large cavities, whose walls are more or less collapsed, and have an ulcerated or worm-eaten appearance, while the redder tissue, in several places, shows groupings of small channels cut across.

"Microscopical examination shows that the large cavities and smaller channels have a narrow uniform lining of caseous material. In their immediate vicinity a few tubercles appear. The intervening tissue shows distinct remains of kidney structure. Where the kidney is still recognisable with the naked eye, the outer limit of the cortex is well defined. In the midst of a fibro-cellular basis the malpighian bodies appear transformed into conspicuous bright nodules of fibrous tissue. Here and there a portion of convoluted tubule appears, and the straight tubules persist in considerable numbers. The arteries are very notable by the great thickening of the middle coat which has taken place. The capsule of the shrunken organ has become the seat of great adipose development, with numerous foci of round cell infiltration."

Would it not have been better to have done nephrectomy soon after patient rallied from the previous nephrotomy? There would have been less dense adhesions, and the operation would have been easier.

Thornton advocates this, and advises abdominal incision.

From Dr. Buchanan's report, we have evidently a tubercular kidney in this case. This would seem to show that we may have a localised tubercular affection of a kidney to deal with. The misleading symptom in the case was the vesical

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symptoms, which pointed strongly to the bladder being the seat of the mischief, while the kidneys really were at fault.

IV.—SPECIMEN OF MALIGNANT DISEASE INVOLVING BOTH MAMMÆ AND COSTAL PLEURA.

By Dr. Beatson.

This specimen of malignant disease involving both mammæ and costal pleuræ was taken *post-mortem* from a married woman, aged 36, the mother of seven children, the youngest of whom was born some four years before her death. She nursed none of her children, but with this youngest one she made a very determined effort. After this she suffered from an eczematous condition of the nipple, which never seems to have disappeared.

In September, 1894, she noticed a small lump in her left breast about the size of a marble. It was painless, but gradually increased in size, and then she suffered some pain. She was admitted to the Western Infirmary in December, and on the 11th of that month an abscess was opened in the left axilla. She was discharged in January of this year, as nothing further could be done for her. She was taken home, and died on the 13th March, 1895, having suffered great pain. Her chief symptom was dyspnœa, and death occurred somewhat suddenly.

Permission was given to examine the thorax, and this was so done as to allow of both mammæ and axillæ, with sternum and portion of left ribs and costal pleura, being removed *en masse*, as the specimen shows. The left pleural cavity was full of sero-purulent fluid, the heart being displaced to the right, and the left lung pushed backwards against vertebral column. The lungs themselves showed no deposit in them; but both the visceral and parietal pleuræ were studded with nodules, while the retro-sternal glands were also the seat of a new formation.

Dr. Buchanan's pathological report is as follows:—"On looking at the specimen, it will be seen that the left breast presents a fungoid ulceration over its whole extent, and encroaching on the surrounding skin to a considerable extent. It is firmly adherent to the pectoral muscles, which are extensively infiltrated with the new growth, which extends towards the axilla. The underlying costal pleura shows a number of tumour nodules, giving it in some parts a finely granular appearance.

"The right breast has a sodden and œdematous appearance,

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and on examining it from behind it exhibits extensive infiltration with tumour tissue, which also can be traced towards the axilla to a mass of enlarged glands.

"Examination of the isthmus of tissue between the breasts reveals no distinct channel of infection in the subcutaneous tissues; but on looking at the skin surface, a number of small, whitish, slightly projecting nodules are evident, which are considerably in advance of the ulcerated edge, and have crossed the middle line.

"Microscopic examination of portions from both breasts shows typical cancerous appearances.

"The specimen has lain in nitric acid."

The present case illustrates very well that lymph gland dissemination which is such an invariable concomitant of mammary cancer. What does this lymph involvement mean? It would almost seem a barrier against the spread of the disease.

The case also opens up the question, How did the right breast become involved. I think in this case by direct extension.

I have at present in the Cancer Hospital a case similar to this, where the lymph channels can be seen red and distinct.

The implication of the pleura also brings out the close connection between the mammary and pleural lymphatics, possibly through the retro-sternal glands.

Meeting VIII.—13th May, 1895.

The President, Dr. Knox, *in the Chair.*

I.—Specimen of the Cochlea, exfoliated from a case of old suppurative disease of the ear.

By Dr. Galbraith Connal.

The description of this specimen will be found in the original article at p. 161.

Dr. Knox expressed the thanks of the Society to Dr. Connal, not only for showing his own case, but also for the labour which he must have expended in searching out references to authorities, and bringing the subject so thoroughly up to date.

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Dr. Barr showed the specimen mentioned by Dr. Connal as having been submitted to the Society in 1886.[1] He said that the condition of the hearing in those cases of exfoliated labyrinths was very interesting. In certain cases, as Dr. Connal had mentioned, it was alleged that some hearing was left after exfoliation of part of the labyrinth. It was always difficult to exclude hearing by the other ear, supposing it to be fairly healthy. Even in his own case just quoted, in which the whole osseous labyrinth of the right ear had been removed, and in which it had thus been impossible to think that any hearing could remain on that side, they had found some consciousness of sound when tried with a trumpet inserted into the right ear.[2] Dr. Barr thought this was to be explained as due to osseous conduction to the left ear. He had a case more recently with exfoliation of part of the cochlea, in which there seemed to be some hearing left. When there was exfoliation simply of the cochlea or of part of it, it was possible to have some remnant of hearing.

As regards vertigo, Dr. Barr said that in his cases, although the semicircular canals were lost on one side, the patient had no disturbance of equilibrium. This seemed to destroy the theory that part of the function of the labyrinth was the maintenance of equilibrium. When there was loss of equilibrium associated with ear disease, he thought it was not due to loss of the part, but to irritation passing to the central nervous system, the centre of equilibrium being near the entrance of the vestibular nerve. So, in Dr. Connal's case, the loss of equilibrium had been at an early stage, when such irritation might be supposed to be present; after the destruction and removal of the diseased part of the labyrinth the disturbance of equilibrium had ceased. It was the view now generally held, by specialists at any-rate, that absence or total destruction of the semicircular canals had no effect upon the equilibrium of the body.

Dr. Finlayson thought that Dr. Barr's suggestion, that the absence of the semicircular canals in his case went to prove that the equilibrium of the body was not dependent on those structures, was an unfair proposition. He understood that the patient had still had his semicircular canals intact on the other ear, and his equilibrium might have been maintained by them. If there were any case recorded, in which the semicircular canals were lost in both ears without disturbance of

[1] For description of Dr. Barr's case, see *Transactions of the Glasgow Pathological and Clinical Society*, vol. iii, p. 16.

[2] *Loc. cit.*, p. 17.

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equilibrium, he could see the force of the argument, but not otherwise.

Dr. Connal had not met with the record of any case such as Dr. Finlayson asked for; but, in regard to the point which had been raised, he might say that in his own case one ear had been normal, while the other had had a suppurative inflammation, probably involving the labyrinth, for two years before the patient presented himself for treatment. He had had stumbling and a tendency to fall forward, in spite of the fact that the semicircular canals in one of his ears might all that time be supposed to be normal. This disturbance of equilibrium Dr. Connal would explain as being probably due to irritation in the affected ear, passing back to the semicircular canal on that side. When the cochlea had exfoliated and irritation ceased, the disturbance of equilibrium had disappeared.

II.—SPECIMEN OF SARCOMA OF THE CLAVICLE.

By Dr. Gibb.

Microscopic sections from this tumour were shown, and Dr. Gibb submitted the following report of the case from which it had been obtained:—

L. G., aged 16 years, mill-worker, consulted me on 9th November, 1893, on account of a tumour situated partly on the neck, and partly on the chest. Regarding the duration of the swelling I could learn nothing, as the girl was reticent, but it had never given her any pain. Three months previously she had consulted Dr. Brownridge, who found a small tumour near the sternal attachment of the clavicle, so soft that he regarded it as a cyst. When seen by me the swelling was steadily increasing. It extended upwards beneath the left sterno mastoid, and downwards below the clavicle to left of sternum. It was so soft that I concluded its contents were fluid and aspirated, withdrawing only a drachm or two of blood. I then advised removal of the tumour, but the girl delayed for two months, when she was admitted to the Paisley Infirmary. The tumour, of pear shape, now extended from the cricoid cartilage to 2 inches below the clavicle; it was 1 inch broad at the upper end, 2 inches at the lower, soft and elastic, in parts almost fluctuant, painless throughout. The girl seemed otherwise in good health, felt well, and had good colour.

15th January.—On making a vertical incision the whole

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length of the tumour, a soft greyish mass presented itself. Removal of this was followed by free hæmorrhage from numerous small vessels. The tumour was encapsuled, and it was now found to extend deeply behind the inner end of the clavicle. The bone was now cut about union of middle and inner third, and its attachments separated. The growth was found to spring from the sternal end, which broke off while being removed. After clipping away as much of the capsule as was deemed safe, the wound was closed. The portion of clavicle removed measures about 2½ inches. I confess it was not till the tumour was exposed that the idea of any connection with the clavicle crossed my mind. The removal of the sternal end was extremely troublesome: as Treves puts it, "resection of the sternal portion is most difficult and dangerous."[1] The wound healed quickly, and in a fortnight the girl was able to go about the ward. A month later she was able to use her arm freely, and to raise it above the head. In April she returned to work, and continued in apparently good health until March last, when Dr. Brownridge saw her on account of recurrence of the growth in the site of the original tumour, and on the left side of the neck higher up. Death occurred on 21st April, fifteen months after operation.

Remarks.—Sarcoma affecting the clavicle would appear to be met with somewhat rarely. I do not know that any case has been reported in this Society of late years. In his article on sarcoma of the long bones, based on 165 cases,[2] Gross expressly excludes sarcoma of the clavicle, apparently on account of its rarity. In 1876 Mr. Walsham shewed sections from a case at the Pathological Society of London.[3] The tumour was not encapsuled, but infiltrating, and originated in the periosteum; and Mr. Walsham remarked that "in the *Transactions* of the Society only three specimens of tumour of the clavicle are recorded, and these are reported as probably carcinomatous. This specimen appears, therefore, to be the first of its kind as yet exhibited before the Society." Chiene[4] gives a case similar in many of its features to the one now reported—the inner two-thirds of left clavicle were removed from a youth of 26; duration of growth was six months, and it was encapsuled. Syme,[5] in 1847, removed the whole clavicle for a central tumour of the bone—probably a sarcoma—of over

[1] *Surgical Applied Anatomy*, p. 190.
[2] *American Journal of Medical Science*, new series, vol. lxxviii, p. 17.
[3] *Transactions of the Pathological Society of London*, 1876, vol. xxvii.
[4] *Edinburgh Medical Journal*, 1873, vol. xxiii, pp. 77, 78.
[5] *Pathology and Practice of Surgery*, p. 293.

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two years' duration; and he gives it as the first case of the kind in this country, so far as he knew. These cases all recovered, but it is not related whether recurrence took place. From the relation of the main part of this growth to the clavicle, its origin seems to have been periosteal. Sarcoma originating in this way appears, in the case of the long bones generally, to be much more liable to recur after operation than myeloid sarcoma, and probably the same is true of the clavicle. In the case of osteo-sarcoma recorded by Mott,[1] of Philadelphia, the patient died, free from recurrence, fifty-four years after removal; while that by Wheeler,[2] of Dublin, was sound at the end of ten years.

Dr. R. M. Buchanan reported as follows on the pathology of the tumour:—

"Several portions of friable tumour tissue are submitted for examination.

"The largest piece is in the form somewhat of a cap with some thin bone in its substance—the piece being suggestive of the inner end of the clavicle almost absorbed and replaced by tumour tissue.

"On microscopic examination, the tissue presents the characters of sarcoma of a short spindle-celled type."

Mr. Maylard said that the case was really so rare that much could not be said about it, but one point seemed to him to be of special interest—namely, the fact mentioned by Dr. Gibb about aspiration. Some sarcomata were so fluctuant that they were mistaken for abscesses. He always remembered a case which he had seen as a student, in which the surgeon, thinking he had to deal with an abscess, had plunged in his knife, and very severe hæmorrhage had resulted. Mr. Maylard thought the consequences in the present case would probably have been similar if Dr. Gibb had not followed the plan which had been described.

Dr. Gibb added that the most interesting part of the operation was the removal of the sternal end. He thought that the best way was to work close to the bone with curved scissors, and he had thus had no difficulty. In dealing with the upper part of the tumour, near the larynx, where removal had been chiefly effected by scooping, and bleeding had been very troublesome.

[1] Quoted in Jacobson's *Operations of Surgery*, p. 146.
[2] *Ibid.*, p. 148.

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III.—SPECIMEN OF A TUMOUR IN THE FLOOR OF THE FOURTH VENTRICLE.

By Dr. Finlayson.

M. B., æt. 20, was brought to the Glasgow Western Infirmary on 17th December last, by Dr. Crawford, of Keswick, as he suspected she had a cerebral tumour. The most striking feature was a convergent squint, from marked paralysis of the left external rectus, and on the same side there was a very distinct facial paralysis. There was also a notable degree of unsteadiness in walking, amounting almost to staggering.

On admission to the ward, the paralytic nature of the squint was easily demonstrated, and diplopia, homonymous in character, was made out when the object was carried to the left; but it was found to occur likewise when carried to the extreme right, this being due obviously to the presence of a *slight* paralysis in the right external rectus also, and a very slight degree of ptosis on this side was sometimes recognisable. The testing of the paralysed facial muscles raised a doubt at first as to the diagnosis, as there was "reaction of degeneration" with altered polar reactions, and slow vermicular contractions with the galvanic current. If, therefore, the paralysis were really cerebral in origin, it seemed as if we must regard it as nuclear. There was no affection of the hearing. The sense of taste also was found affected on the left side of the tongue, a feature commoner in peripheral than central lesions implicating the facial nerve. Further, on examination of the eyes no optic neuritis was present. There was no definite nystagmus. Increase of tendon reflexes was noted in upper and lower limbs, and in the jaw.

The history, no doubt, pointed to a cerebral affection, as headache and vomiting had been present more or less for about a year, and she had to give up her work, as a waitress in a hotel, about Christmas 1893. Even before this her left eye had begun to squint, and it was operated on in Carlisle Infirmary in April, 1894, without much benefit; and even at that time the surgeon there had recognised, and had told her, that her face was paralysed on the left side.

Under observation in the Western Infirmary, the staggering was regarded as due in part to the ocular paralysis, and her erroneous estimate of the position of objects from this cause was repeatedly demonstrated. An attempt was made to lessen this by giving her spectacles with an opaque plate

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for the left eye; this obviated the diplopia and lessened the unsteadiness of the gait; but, as already stated, the external rectus of the *right* eye was also slightly paralysed, and so the erroneous projection was not entirely met by this device.

Her general health was fairly good. Some irregularity in menstruation was habitual, and she had been often treated for anæmia. There was nothing in her personal or family history to throw light on the nature of the tumour in the brain, if such existed. Her mother had died of cancer, her father was said to have had inflammation of bowels, and a brother had died of inflammation of lungs after measles.

Nothing wrong was made out in heart and lungs. The urine contained, at times, a mere trace of albumen; but repeatedly sugar was detected in the urine, if several samples were kept in the day. The demeanour of the patient presented no trace of the hysterical tendency, and there was no ovarian or mammary tenderness.

In view of the chance of syphilis, in one of her age and occupation, it was thought well to try mercurial inunction, in case of its being a syphilitic tumour; and at first she seemed to improve.

In the beginning of February, however, pain and weakness in the right knee were complained of; a hemiplegia seemed impending; regurgitation of fluids began to occur on drinking; and the speech became somewhat affected. The palatal reflexes, formerly tested and found normal, were now found abolished, although sensation there was preserved, and optic neuritis had appeared, especially on the left. Curiously, the sense of taste, formerly impaired on the left side, had now recovered.

On laryngeal examination the cords did not get quite approximated.

On 12th February the temperature went up slightly, the right eyelid became swollen, and at 9 P.M. she was found so quiet that she was thought at first to be dead, the respiration having almost stopped; the pulse, however, was good. Loud crowing and snorting respirations occurred, three or four in a minute, accompanied by ejections of fluid, with slight, short, scarcely perceptible breaths between the deep ones. This state lasted till 1 o'clock next morning, when she died without much elevation of temperature, 101·2° being the highest.

The pupils were widely dilated before death, and the iris moved with the respiratory act.

The *post-mortem* examination showed slight tubercular disease at the apices of the lungs, and there were tubercles also at diaphragm. The cerebral convolutions were flattened

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and dry. The medulla and pons were flattened, mostly on the right side. On dividing cerebellum a tumour, tubercular in nature, was found in the floor of fourth ventricle, chiefly on right side, but causing deviation of raphe to left; and the left portion was softened and greyish.

The tumour measured $2\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{2}$ centimetres.

As regards the diagnosis, on admission the headache and vomiting, with paralysis of the sixth and seventh nerves on the left side, and the staggering gait, pointed to a cerebral tumour. The reaction of degeneration in the facial muscles, and the absence of optic neuritis, seemed points against this diagnosis. The former difficulty was overcome by supposing that the paralysis involved the nucleus, or some part of the nerve trunk; and the absence of optic neuritis was explained on the idea that it might yet be developed in the case. The detection of sugar in the urine seemed to strengthen the idea of the lesion being situated in the fourth ventricle, near the nuclei of the paralysed nerves; and, as already stated, optic neuritis subsequently appeared.

The paralysis of cranial nerves, both on the right and the left side, seemed to indicate the bilateral character of the central lesion. The sudden aggravation of the symptoms, in the form of hemiplegic paralysis, with the loss of the palatal reflexes, pointed to a grave extension of the mischief; while the terminal symptoms showed clearly the implication of the respiratory centre, the breathing getting greatly impaired, while the pulse remained good. Incidentally, the pupillary dilatations with the deep inspiratory efforts are worthy of note.

Dr. Bryce asked if there had been no loss of hearing. The centre of the tumour was exactly over the site of the nucleus of the auditory nerve, and it seemed curious that that nerve should have escaped.

Dr. Finlayson replied that there had been absolutely no deafness.

Dr. Knox asked if there had been any fluid in the ventricles.

Dr. Finlayson replied that there had. It was that that had flattened the convolutions, and caused them to appear dry.

IV.—REPORT UPON CASE OF SUPPOSED RUPTURE OF THE BLADDER.

By Dr. T. K. Monro.

Dr. Monro showed a microscopic section of part of the bladder wall from the case which he had described to the

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Society at its meeting on 18th February.[1] He submitted the following additional report:—

When a portion of the bladder wall near the seat of apparent lesion is examined microscopically, it is found to consist of the following series of layers:—(1) The mucous surface, and underneath it, unstriped muscular tissue. (2) A thick layer of adipose tissue. (3) A layer of what seems at first sight to be unstriped muscular fibres. There are not many nuclei of muscular fibres to be seen, however, and this layer is crowded with round cells, many of which have multiple nuclei. The ground substance consists probably to a large extent of fibrin. (4) Another thick layer of adipose tissue. (5) Fibrous tissue with spindle-shaped nuclei.

Near the middle line the two layers of adipose tissue (2 and 4) cease on either side, so that the bladder wall becomes much thinner, and a well marked depression is formed both on the internal and on the external surface. As these depressions are of some linear extent vertically, they gave rise to appearances which suggested, before an incision was made at this situation, that a rupture had taken place and healed.

V.—CARD SPECIMENS.

A. By Dr. R. M. Buchanan.

Specimens of the blood in leukæmia and pernicious anæmia.

B. By Dr. Bryce.

Drawings of a fœtus, the subject of retroflexion, ectopia viscerum, spina bifida, ectopia vesicæ.

REVIEWS.

Diphtheria and its Associates. By Lennox Browne, F.R.C.S. Ed. London: Baillière, Tindall & Cox. 1895.

Diphtheria is a subject which has been so prominently before the medical profession for the past eighteen months that one welcomes any treatise like the present, which will gather together and sum up our knowledge of the disease, and, as it were, report progress.

[1] See *Glasgow Medical Journal*, 1895, vol. i, p. 384.

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Mr. Lennox Browne is well known as a leading throat specialist, and as one who has taken a prominent part in the various discussions on diphtheria, so that a book on this subject, written by him, is of special interest.

In the preface the author calls his book "an essay," and as such it has evidently been his aim to give a complete account of the main points of interest in connection with diphtheria.

He begins with its history (750 B.C. to A.D. 1884), and from that he goes on to its etiology. Here the chapter on "predisposing causes" is of much interest, is well thought out, and, we consider, one of the best in the book. It treats of these causes from the geological and geographical aspects; in relation to the rainfall, the season of the year, and domestic surrounding; in relation to various other epidemics, and to constitutional predispositions. Under the "exciting causes" is given an account of the various organisms and their products met with in diphtheria.

Then, passing over the chapters on pathology and on bacteriological diagnosis, we come to a series of cases treated by the author. These cases are well arranged into groups, according to the kind of organism or organisms found in the throat. The drawings illustrating the cases are very well executed, and add considerably to their interest. The elements of prognosis are now discussed at some length, the author arranging his statistics to show the relation of the mortality to the locality of the false membrane, and to the kind of organisms causing the membrane. He also urges for a more careful examination of the urine as an aid to prognosis.

The chapter on croup gives an account of the position at present held as to the exact nature of this much discussed affection.

On the general treatment of diphtheria the book is good, both in principle and in detail. One might, perhaps, find objection to salicylate of soda being given "to reduce general pyrexia," when we are told in another place that the temperature rarely goes above 100° or 101°. Also the treatment of the paralytic sequelæ is rather scanty. We are told that "so soon as there is reduction of inflammation, electricity, either in the induced or constant form, as indicated by the reactions, is to be employed." Now the modern practice, as we understand it, is to use the galvanic current in the inflammatory stage of peripheral neuritis, and not to wait till the disease has fully developed. And, further, the indication as to the choice of electricity would be based on a more rational principle than the mere reaction of the muscles.

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As to the serum treatment, Mr. Browne does not seem very hopeful. He contrasts 100 cases treated by serum with 100 cases treated by the older methods, and finds that the mortality (27 per cent) is the same in both. Now these observations are of much interest as a contribution to our information on this subject, but, in view of the statistics of others, we cannot in any way accept them as final. In the same way we must treat, in the meantime, the author's conclusions as to the renal complications. It is only fair to add that the serum treatment of diphtheria is not included in the essay, but added as an appendix.

Of the book as a whole we have formed a high opinion, and have every confidence in recommending it to our readers.

Tumours, Innocent and Malignant: Their Clinical Features and Appropriate Treatment. By J. BLAND SUTTON, Assistant Surgeon to the Middlesex Hospital, London. With 250 Engravings and 9 Plates. London: Cassell & Co. 1893.

THIS is, unfortunately, not a translation of Virchow's classical work, nor can it be regarded in the light of a true sequel. It is virtually a rearrangement of our knowledge regarding tumours, and from this point of view its title is somewhat misleading. It would better be expressed as "an attempt to classify tumours on similar lines to those employed in biology."

Alban Doran, in his most excellent work on *Tumours of the Ovary, Fallopian Tube and Broad Ligament*, at p. 27, makes the following statement:—"Although a tumour is not quite so distinct a unit as is any species of animal or plant, pathological nomenclature should be applied on the principles adopted in other sciences." The work before us is the application, and we feel it our duty to present to our readers this novel classification of tumours *in extenso*, in order that they may judge of it for themselves:—

CLASSIFICATION OF TUMOURS.

GROUP I. CONNECTIVE TISSUE TUMOURS.

Genus I. Lipomata

Species 1. Subcutaneous. 2. Subserous. 3. Subsynovial. 4. Submucous. 5. Intermuscular. 6. Intramuscular. 7. Parosteal. 8. Meningeal.

Genus II. Chondromata.

Species 1. Chondromata. 2. Ecchondroses. 3. Loose cartilages in joints.

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Genus III. Osteomata.
Species 1. Ivory osteoma. 2. Cancellous osteoma.
Genus IV. Odontomata.
Species 1. Epithelial odontome. 2. Follicular odontome. 3. Fibrous odontome. 4. Cementome. 5. Compound follicular odontome. 6. Radicular odontome. 7. Composite odontome.
Genus V. Fibromata.
Species 1. Simple fibromata. 2. Molluscum fibrosum. 3. Neuro-fibromata.
Genus VI. Myxomata.
Species 1. Nasal and aural polypi. 2. Cutaneous myxomata. 3. Neuro-myxomata.
Genus VII. Gliomata
Genus VIII. Sarcomata.
Species 1. Round celled. 2. Lympho-sarcoma. 3. Spindle-celled. 4. Myeloid. 5. Alveolar. 6. Melano-sarcoma.
Genus IX. Myomata.
Genus X. Neuromata.
Species 1. Neuro-fibroma. 2. Plexiform neuroma. 3. Traumatic neuroma.
Genus XI. Angeiomata.
Species 1. Simple nævus. 2. Cavernous nævus. 3. Plexiform angeioma.
Genus XII. Lymphangeiomata.
Species 1. Lymphatic nævus. 2. Cavernous lymph-angeioma. 3. Lymphatic cyst.

GROUP II. EPITHELIAL TUMOURS.
Genus I. Papillomata.
Species 1. Skin warts. 2. Villous papillomata. 3. Intracystic warts. 4. Psammomata.
Genus II. Epithelioma.
Genus III. Adenoma.
Species 1. Mammary. 2. Sebaceous. 3. Thyroid. 4. Pituitary. 5. Prostatic. 6. Parotid. 7. Hepatic. 8. Renal. 9. Ovarian. 10. Testicular. 11. Gastric. 12. Intestinal. 13. Fallopian. 14. Uterine.
Genus IV. Carcinoma.
Species 1. Mammary. 2. Sebaceous. 3. Thyroid. 4. Prostatic. 5. Parotid. 6. Pancreatic. 7. Hepatic. 8. Renal. 9. Ovarian. 10. Testicular. 11. Gastric. 12. Intestinal. 13. Fallopian. 14. Uterine.

GROUP III. DERMOIDS.
Genus I. Sequestration dermoids.
Genus II. Tubulo-dermoids.
Genus III. Ovarian dermoids.
Genus IV. Dermoid patches.

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GROUP IV. CYSTS.
Genus I. Retention cysts.
Species 1. Hydrometra. 2. Hydrosalpinx. 3. Hydronephrosis. 4. Hydrocholecyst.
Genus II. Tubulo-cysts.
Species 1. Vitello-intestinal. 2. Allantoic (urachal). 3. Paroöphoritic. 4. Parovarian. 5. Cysts of Gartner's duct. 6. Cystic disease of testis. 7. Encysted hydrocele of testis. 8. Cysts of Müller's duct.
Genus III. Hydroceles.
Species 1. Tunica vaginalis. 2. Canal of Nuck. 3. Ovary. 4. Neck.
Genus IV. Gland cysts.
Species 1. Ranulæ. 2. Pancreatic cysts. 3. Chyle-cysts 4. Dacryops.
SUB-GROUP. PSEUDO-CYSTS.
Genus I. Diverticula.
Species 1. Intestinal. 2. Vesical. 3. Pharyngeal. 4. Œsophageal. 5. Tracheal. 6. Synovial. 7. Meningeal.
Genus II. Bursæ.
Species. Bursa.
Genus III. Neural cysts.
Species 1. Hydrocephalus. 2. Hydrocele of fourth ventricle. 3. Meningocele (cranial). 4. Spina bifida.
Genus IV. Parasites.
Species. Hydatids.

It will be observed that the classification is more pathological than clinical; that the question of malignancy, for example, is not taken into account, and that the factors which determine the species (anatomical distribution, histological characters, causation) vary in the different groups and genera.

Nothing is easier than picking flaws in any classification, nothing more difficult than substituting one which will satisfy the requirements of all. It is not our intention to do either. We would simply satisfy ourselves by drawing special attention to the dissociation of epithelioma from carcinoma, and asking our readers if this is warrantable.

Judged apart from the classification, the volume has its merits and demerits. Among the former we would instance the introduction of comparative pathology to elucidate certain points in connection with the pathology of tumours in the human subject; the double-index as affording a means of rapidly ascertaining the tumours to which an organ is liable, and the distribution of tumours among the organs, and the very numerous and excellent illustrations. As one would

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anticipate, dermoids, cysts, and odontomata—subjects upon which the author has thrown much light—receive a great share of attention—perhaps too great. Thus, for example, over 200 pages are devoted to the consideration of dermoids and cysts, while important tumours like adenomata and carcinomata are discussed together in sixty pages. Other instances of such inequality might be quoted. Further, errors of omission, as well as of commission, are present. We have looked in vain, for instance, for a reference to rodent ulcer, which surely should at least have been mentioned. We have been equally unfortunate in our search for a description of tumours of the spleen, either solid, cystic, or parasitic, and of sarcoma and, what is less pardonable, of fibroma (fibrous polypus) of the rectum. Where extremely rare tumours are discussed in detail, the existence of the above mentioned should certainly be noted. Wood's painful subcutaneous tubercle the author describes as a fibroma, instead of classifying it, as we are inclined to do, among the myomata, while psammomata find a place among the papillomata, not among the sarcomata, as is perhaps more usually the case.

The weakest portion of the work, however, is to be found under the heading of "The Cause of Tumours." The allotting of only eight pages to the consideration of a subject of such extreme importance looks something like shirking a difficult task.

We have regarded this volume mainly from the pathological standpoint, and have made a point of testing it as a book of reference—hence the delay in the appearance of our notice. As such we have found it thoroughly reliable, and we trust that this may be the experience of students and practitioners alike.

The Truth about Vaccination; being a Report on Vaccination as a Branch of Preventive Medicine. By ERNEST HART, D.C.L. Second Edition. London: Smith, Elder & Co.

THIS little book of sixty pages is the medical argument for the utility of vaccination, and the evidence contained therein is based on some of the statistics collected by the Royal Commission on Vaccination, and published in the five Blue Books. The author comments on the falling off in infantile vaccination, and ascribes this to various causes; but those who have gone through the Blue Books from a layman's point of view will grasp how powerfully the anti-vaccinator's argument must appeal to the general public, and produce

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irresolution and that paralysis of will and action which conflicting evidence always brings. Compulsory vaccination has stirred up a certain amount of hostility to medical men, and even to vaccination itself. Many good men in the profession saw the danger, and were against compulsion; and doubtless there are many more now who would rather see vaccination permissive. Under permissive vaccination it may be questioned if there would be anything like the present falling off in infantile vaccination. As regards revaccination, its infrequency is a measure of the belief of the adult in the arguments for vaccination. What the public does under the influence of panic affords no criterion of its belief; and to enforce revaccination would, in the opinion of the writer of this review, be a most fatal mistake. In dealing with vaccination, our purpose would be much better served by sweet reasonableness rather than in stirring up strife by presenting incomplete statistics capable of various explanations. There are some who hold the appointment of a Royal Commission to have been a mistake, and who think it not yet too late to have an inquiry made by competent medical men into the whole practice and utility of vaccination and revaccination. The practice of vaccination by the medical profession is more or less founded on traditional authority, and there are many points which require demonstration even to medical men—notably the doctrine that immunity of attack and mortality are proportional to the number of marks. The author treats too lightly of the risks of vaccination, as a reference to *Illustrations of Clinical Surgery* (vol. i, Hutchinson) will show, where a fair number of cases of vaccination-syphilis is recorded. The small proportion of cases is no argument, as, after all, the practice of vaccination, the risk of inoculation, and the resistance to vaccination are individual. The chief value of this book is as an index to what is contained in the Blue Books.

A New Method of Inhalation for the Treatment of Diseases of the Lungs. By W. H. SPENCER, M.A., M.D. Cantab., London: The Scientific Press, Limited.

THE apparent object of this book is to direct attention to, and explain the construction and uses of a new form of inhaler. The first part of the book consists of an essay on the principles of inhalation and the laws which govern the diffusion of gases and vapours. In describing the fallacies of many of

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the ordinary methods of inhalation, the author very properly draws attention to the fact that the vapour of most of the volatile oils commonly used for inhalation purposes is intensely odorous, so that a very minute quantity of the vapour from these oils will create an odour out of all proportion to the amount of vapour causing the odour. On account of the strong character of the odour, the impression is that the patient is inhaling a large quantity of the active ingredient, though in reality the quantity which becomes volatilised, from the sponge of a respirator for instance, is exceedingly small in most instances. This fact was emphasised years ago by Dr. Hill Hassell, who, by experiments, proved that when carbolic acid, creasote, thymol and the like, were used with an oro-nasal inhaler, four-fifths of the antiseptic could be recovered from the sponge of the inhaler after many hours' use.

To obtain the full effect of the antiseptic employed, the author holds that it must be volatilised by artificial heat, and that the evaporation process must be steady and uniform, at a temperature which insures the conversion of the volatile oils into their natural vapour; and that the patient must be placed in this medicated atmosphere and kept in it—"always, if needs be."

The author's vaporiser consists of a circular evaporating pan immersed in a water-bath fixed at any required height on a wire frame, and beneath is an oil lamp which may be replaced by a night-light, and which supplies the heat necessary for the evaporisation of the selected volatile oil. It appears to be worthy of the attention of physicians dealing with affections of the respiratory organs, but its usefulness must be determined by experience.

Practical Zoology. By the late A. MILNES MARSHALL, M.D., D.Sc., and C. HERBERT HURST, Ph.D. Fourth Edition. Revised by C. H. Hurst.

ON the appearance of the third edition of this excellent work, it was favourably noticed in these columns. The alterations which have now been made are not of such a nature as to call for special notice here, although they tend to make the book still better fitted for the purpose which it is intended to serve—viz., that of a guide for a junior laboratory course in zoology.

It is to be regretted that this work is still without a chapter on the frog, and to that extent incomplete. There seems to

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be no good reason why the admirable little work by the late Dr. Marshall on "The Frog: an Introduction to Anatomy, Histology, and Embryology," which is at present published separately, should not be included in this volume. The inclusion of this work, or the addition of a section dealing with the frog, either of which could be done without making the book too bulky, would be an improvement which, we think, would commend itself alike to demonstrators and students.

ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

MEDICINE.

By T. K. MONRO, M.A., M.D.

Fat-Necrosis Induced by Experimental Operations on the Pancreas.—Hildebrand of Göttingen, believing that the pancreatic juice is the agent that excites fat-necrosis, arrested the flow of this secretion by operation. He ligatured the splenic portion of the pancreas of a cat in two places. In other six animals he tied at the same time the veins coming from the gland, so as to prevent removal of the juice by the blood. The animals survived for about ten days, becoming greatly emaciated; in one instance there was glycosuria. After death it was found that there was no peritonitis; but at the place where the ligature had been applied, and in the region of the pancreas generally, whitish opaque spots, like fat-lobules, were observed in the mesentery.

Hildebrand thereafter removed a piece of the pancreas of a cat, and grafted it in the mesentery of another cat; whilst in a third animal he introduced a whole pancreas into the abdominal cavity. The cats lived for several weeks. No peritonitis occurred, but here again fat-necrosis was discovered after death. This occurred in the animal in which section of the pancreas in its continuity allowed the secretion to flow into the abdominal cavity, as well as in the others. Obviously the necrosis was due to the action of the pancreatic juice. The question now remaining was as to the particular constituent of the secretion which possesses this property.

A pupil of Rosenbach, who experimented with pancreatin mixed with other constituents of the pancreas, found dilatation of the vessels and necrosis of fatty tissue. Hildebrand repeated these experiments with pure tripsin. When he employed only small quantities the animals appeared not to suffer. When he sprinkled larger quantities, say one gram, over the intestines, he found after death that the intestines were streaked with blood; there were hæmorrhages under the serous coat, but not a trace of fat-necrosis. Hildebrand therefore concludes that fat-necrosis is due to the action, not of tripsin, but of certain fat-ferments.—(*Deut. Med.-Zeit.*, 20th May, 1895.)

Mitral Stenosis and Pregnancy.—Hermann B. Allyn has studied the influence of pregnancy on 62 women who were the subjects of mitral stenosis. Of the 62 patients 23 died, either in the course of pregnancy, in parturition, or within three weeks after delivery. The most fatal period for such women is just after delivery; 14 of the 23 died in sixteen to twenty-two days after the birth of the child, 2 died in labour, and 7 before parturition set

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in. Abortion or premature labour was not infrequent, so that the risk under such circumstances is not only to the mother. The pulmonary symptoms of mitral stenosis are specially prominent in pregnancy—dyspnœa, bronchial catarrh, and pulmonary œdema. These may give trouble before the fourth month of pregnancy, but do not as a rule become clamant till after the sixth month. Hæmorrhages from the lungs and uterus are pretty common, but are to be regarded in a favourable light, for they occurred in only 8 of the 23 fatal cases, whereas they happened in 18 of the cases that ran a favourable course. Anasarca, albuminuria, and convulsions are not constant.

Marriage, therefore, and still more pregnancy, are undesirable for women with heart disease. If pregnancy has occurred, and symptoms of cardiac disablement set in, the patient must be enjoined to rest as much as possible, and to avoid all excitement. The practitioner must not be too anxious to suppress hæmorrhages after confinement, and ought to avoid ergotin altogether.

During labour, chloroform should be given when the pains are too severe, and also in the later stages, to arrest the voluntary efforts of the patient to expedite delivery.

In view of the special danger to which such patients are exposed for some time after delivery, the need of prolonged rest in bed is obvious.—(Quoted in *Deut. Med.-Zeit.*, 30th May, 1895.)

Experimental Production of Generalised Lymphadenoma.—Delbet found a bacillus in the spleen of a woman suffering from generalised lymphadenoma in its last stages. Pure cultures of this organism were prepared, and injected in large and repeated doses into a dog. The result was to produce a generalised lymphadenoma in this animal. The glands contained the bacillus in a state of purity, but the organism was not found in the blood.—(*Progrès Médical*, 29th June, 1895.)

Tumour of the Corpus Callosum.—Richard P. Francis, in association with Allen Starr and Van Gieson, has published a new case of this kind. The author finds that 18 cases are already recorded in medical literature, the earliest having been published by Mills in 1879. The symptoms as observed by Francis include none that can be looked upon as in any way pathognomonic, and his study of recorded cases has satisfied him that they possess no feature in common.—(*American Journal of the Medical Sciences*, June, 1895.)

Purulent Meningitis caused by the Bacterium Coli.—Scherer records three cases of acute purulent leptomeningitis in nurselings of a few days to a few weeks old, occurring within a short period in Schwing's clinic at Prague. The most significant fact was the finding of the colon bacillus in all three cases. The author thinks that the second and third cases were indirectly infected from the first, through the mouth or external ear, by means of bathing water used in a tub in which the first child had been washed.—(*American Journal of the Medical Sciences*, June, 1895.)

Ulcerative Endocarditis as a Sequel of Gonorrhœa.—Winterberg has reported the case of a man 25 years old who, in the course of an attack of specific urethritis, complicated by epididymitis and enlargement of the glands in the groin, was seized with a chill, followed by fever and malaise, with swelling of both elbow-joints. Rest in bed, with the administration of salicylate of sodium, was prescribed, but improvement failed to ensue. Cyanosis and dyspnœa set in, and speech became difficult and the sensorium obscured. There was general dulness on percussion of the chest, and moist râles were heard, with loud systolic and diastolic murmurs over the heart, especially in the aortic and pulmonary areas. The knees and ankles also became slightly swollen. The liver and spleen were enlarged, the stools contained blood, and the urine was albuminous. Asthenia and death supervened. The autopsy revealed extensive effusion in both pleural cavities.

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Some sero-purulent fluid was found in the pericardium. The heart was enlarged, and the myocardium, which presented a greyish appearance, contained numerous purulent foci. The aortic and pulmonic segments were almost absent, being represented only by some friable caseous material. The cusps of the auriculo-ventricular valves were changed in a similar manner, though not to the same extent. The liver and spleen contained numerous small hæmorrhages. Peyer's patches were reddened and swollen, but not ulcerated. Gonococci were found in the remains of the valves of the heart.—(*American Journal of the Medical Sciences*, July, 1895.)

Ocular Symptoms in Syringomyelia.—Vialet of Paris lately showed to the French Society of Ophthalmology a patient, aged 57, who presented symptoms of unilateral syringomyelia. He had suffered since he was 28 years of age from muscular atrophy in the left upper limb, and sensation was impaired in the usual way. The palpebral fissure was less open on the left than on the right side. The left eyeball seemed smaller than the right; as a matter of fact, it was not smaller, but simply more deeply embedded in the orbit. The left pupil was small; it contracted both to light and in convergence. The right pupil was moderately dilated, and contracted in convergence, but not to light. The patient thus presented three phenomena which were observed by Claude Bernard after section of the cervical sympathetic—namely, diminution of the palpebral fissure, retraction of the eyeball, and myosis. These are due partly to paralysis of the unstriped muscular fibres of Müller situated in the eyelid and orbital aponeurosis, and partly to paralysis of the pupil-dilating fibres by a lesion of the left side of the cord in the ciliospinal region.—(*Progrès Médical*, 8th June, 1895.)

The Story of an Army Surgeon.—Some twenty years ago a surgeon named Macleod was attached to the English army. He was learned and skilful, grave and reserved. His comrades sometimes rallied him on his sobriety and high moral character. He simply shrugged his shoulders. One day in India a lieutenant laughingly reproached him for living "like a young lady." Macleod got up, slapped the officer, and provoked him to a duel. This was fought on the following day, and the surgeon killed his opponent by a single shot from a pistol. He then handed in his resignation, and went home to England to reside in the neighbourhood of London. When he died some years afterwards it was discovered that the surgeon Macleod was a woman, and her papers gave evidence that this woman belonged to one of the most ancient families in the United Kingdom.—(*Progrès Médical*, 22nd June, 1895.)

Scleroderma with Hemiatrophy of the Tongue, ushered in by the Symptoms of Raynaud's Disease.—Chauffard recently exhibited a patient whose case illustrates the relationship between scleroderma and Raynaud's disease. A woman aged 59, subject to migraine and dyspepsia, and slightly hysterical, had a series of attacks of erysipelas supervening at her menstrual periods. The first attack of local syncope occurred in 1893, and involved three digits of each hand and foot. Similar attacks recurred on the occasion of each fresh exposure to cold. The nails became curved, the skin of the digits became smooth and stiff, the face came to appear as if frozen, spots of vitiligo appeared in various parts of the body which had formerly been the seat of eczema, and one half of the tongue underwent atrophy. Raynaud's disease evolved itself, therefore, in the direction of sclerosis instead of in the direction of gangrene.

The commencement of scleroderma with vasomotor phenomena is not unprecedented; the interesting point here is the involvement of the tongue on one side. Chauffard was disposed to exclude a lesion of the hypoglossal nucleus, because there was no paralysis of the palate or of the vocal cord. Neither would he admit a neuritis of the twelfth nerve because of the power of movement retained by the tongue. He considered the condition to be due

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to a muscular sclerosis; in this case it might be termed "myopathic lingual hemiatrophy."

This patient was found to have a small thyroid body, and was treated with thyroid preparations. The attacks of local syncope supervened as often and with the same intensity as before, but the subsequent vasomotor reaction was not so painful.—(*La France Médicale*, 5th July, 1895.)

Necrosis of the Upper Jaw in the Pre-Ataxic Stage of Tabes.—Castel records the case of a man aged 35, an artist, who suffered for ten years from lightning pains in the upper and lower limbs, with gastric crises characterised by incontrollable vomiting. This patient observed one day that his face was swollen, and he shortly afterwards lost three teeth. Similar attacks, each associated with fever, occurred several times. Some teeth fell out twenty-four hours after each attack of swelling. In the course of three years, several pieces of the superior maxilla were eliminated as sequestra. Inco-ordination had not yet begun, and there were no syphilitic antecedents.—(*La France Médicale*, 24th May, 1895.)

GYNÆCOLOGY AND OBSTETRICS.

By E. H. LAWRENCE OLIPHANT, M.D.

Resuscitation of the Apparently Stillborn.—Dr. Pinard, in the *Gaz. Méd. de Paris*, 1895 (quoted in *Centralbl. f. Gynæcol.*), gives an account of 50 cases of apparently stillborn infants; of these, 44 were restored, though 19 died later. In most cases, clearing the air-passages and insufflation of air, along with stimulation of the skin, were enough. In 6 cases, where these means failed, tractions on the tongue gave good results. Dr. Pinard recommends, at the same time, that the traction should be made with the fingers, not with a forceps.

Dr. Laborde relates a case observed by Dr. Guies, in which a child was restored by tractions on the tongue, after a delivery with forceps. While the doctor was attending to the mother the child ceased breathing, but was again restored by rhythmical tractions on the tongue. Tarnier, Gueniot, and others admit the ease with which this method may be carried out without the help of instruments, but still make use of insufflation of air by catheter. This, they maintain also, may act reflexly in exciting the respiratory reflexes.

On a New Method of Preventing Failure of the Heart from Chloroform.—Dr. Rosenberg, of Berlin, writes a paper on this subject (quoted in the *Centralbl. f. Gynæcol.*, 1895, p. 677). Apart from overdosing and careless administration, chloroform syncope is reflex. It is caused—like the respiratory cessation—by peripheral excitement of the trigeminus in the nasal mucous membrane. All inhaled anæsthetics cause the same reflex disturbances. These reflex disturbances may be avoided by spraying the nose with a 10 per cent cocaine solution—two centigrammes into each nostril, and another centigramme three minutes later. A large part of the danger of chloroform narcosis is avoided in this way, and besides, cocaine is an antidote to chloroform.

Langlois and Maurange, writing in the *Gaz. Méd. de Paris* (quoted in same journal), recommend an injection of morphia and spartein before commencing chloroform narcosis.

The Preservation of the Perineum: a New Method.—Dr. M'Cartie contributes a long article on this subject to the *New York Medical Journal*, May, 1895. After explaining and condemning the old methods of "supporting the perineum," Dr. M'Cartie proceeds to describe the various methods advocated in the text-books of pushing forward the head

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under the pubic arch—such as pressure applied on the head just in front of the sacro-sciatic ligaments, or by pressing it forward with a thumb or fingers in the rectum, or just in front of the coccyx. Along with these methods, the various authors advocate pressure on the head itself to retard the passage when this occurs too suddenly or spasmodically. Other authors suggest hooking forward the perineum during a pain to remove the strain from the thinned border and to promote the elasticity of the tissues.

The various methods described deal very little with the position of the head in its passage through the vulva; in fact, the authors all assert the head should be helped through the vulva by means of extension. This idea is evidently adopted on account of the curve at the lower end of the genital canal. The curve of the canal is somewhat forward, but if the perineum and soft parts were removed, the axis of the canal from above downwards would look somewhat backwards. The curve in the coccygeal bones adds to the idea of a forward curve, but these parts are nearly straight when the pressure of the head dilates them. The head of the child is pressed directly downward on the perineum, the resistance of which, being greatest behind, pushes the occiput forward, so that when the head is freed from the outlet the elastic perineum, still acting on the frontal region, presses the occiput towards the abdomen of the mother. But it does not follow that this mode of extension of the head is in progress all the time before the head is born.

On the other hand, flexion is naturally maintained: the elasticity of the perineum is counteracted by the outer rigid bony parts of the genital canal while the head is descending. When the forehead meets the perineal floor extreme flexion occurs, thereby giving the occiput the less chance of slipping out and passing under the pubic arch. Consequently we see the occiput bone long before the forehead. When, therefore, the occiput is born, the pressure of the elastic perineum from behind pushes the base of the occipital bone under the pubic arch, and thereby some extension is caused. According to the usual rules the accoucheur's duty is now to assist extension. Dr. M'Cartie, however, strongly advocates the opposite of this. That is, when the resistance of the bony parts is removed by descent, the accoucheur should substitute a force for the natural one, to counteract the elasticity of the perineum and maintain flexion. This may be done simply and easily as follows:—With the patient in the ordinary lateral position, the accoucheur places the finger tips of the right hand on the occiput, as soon as it appears, with the thumb on bony portion of the parietal bone: pulling towards him he is easily able to secure the required degree of flexion. Dr. M'Cartie argues that by so doing the sub-occipito-bregmatic diameter of $3\frac{3}{4}$ inches comes into the outlet, while, if extension be permitted, the occipito-frontal diameter of $4\frac{1}{2}$ inches is concerned, and in this latter attitude the head forms a round hard mass unlike the conical plug of the well flexed head. He maintains that the strongest pains may be controlled by grasping the head as dictated, so that the head may be delayed till the perineum has sufficiently relaxed. Further, he says, if any extension takes place, the uterus acting directly from the breech to the head, forces the vertex against the lowest and thinnest part of the perineum; but where flexion is maintained, the uterine force is directed through the forehead against the sloping wall of the perineum. By adopting this method, and by delaying the delivery—even returning the whole head into the vagina between the pains—Dr. M'Cartie considers that he now finds rupture of the perineum a rare event.

Cleidotomy or Division of the Clavicles.—Under this heading Dr. Phänomenoff of Kasan, in Russia, contributes an article to the *Centralbl. f. Gynæc.*, 1st June, 1895. This article is noticed in the *New York Medical Journal* in such a way as to leave it doubtful whether the operation is meant to be a conservative one or not. In his original article Dr. Phänomenoff makes it quite clear that this operation is to be performed in the interests of the mother. In this paper Dr. Phänomenoff confines himself to cases of delay in labour, after the birth of the head, where the delay is caused by dispro-

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portion between the size of the child and of the pelvis—excluding locked twins, monsters, &c. Such delay, after delivery of the head by means of forceps, may be as unpleasant as unexpected. In some cases it is found that the head is scarcely completely born, but is pressed against the bony outlet, so that the finger must be pushed well into the vagina to reach the neck. On making traction on the head you will find it will come a little further, but it will spring back when released. Moreover, the head shows no inclination to rotate externally, showing that the shoulders are held at the pelvic inlet. In such a condition of things the accoucheur may find himself at a loss, more so even than with any of the more ordinary abnormalities, such as shoulder presentation; and this because the large size of the child cannot be accurately determined till after the birth of the head, and because the condition is a rare one. The usual procedure in such cases is to apply traction to the head, and pressure either on the fundus or over the lower portion of the uterus. Dr. Phänomenoff recommends, in addition, an attempt to diminish the inclination of the pelvis by raising the sacrum. Should these measures fail, several fingers should be introduced into the genital canal, and an attempt be made to change the position of the shoulders. For example, if they be transversely above the brim, try to bring them into the conjugate or oblique diameter of the inlet; or if they lie in the conjugate with one shoulder over the symphysis, try by combined internal and external manipulation to rotate the shoulders into the oblique diameter. Even should these measures fail, the necessary manipulations will have enabled the accoucheur to diagnose the real cause of the delay. Under such conditions the child soon dies, and embryotomy then finds a legitimate indication. Draw the head well to one side, pass the four fingers of one hand along the child, carefully recognise the position of the shoulders, and feel one of the clavicles. With care there is no great difficulty in passing up strong scissors, and, with a few short clips, dividing the clavicle and overlying soft parts near the sternal extremity. Repeat the operation on the opposite side and the operation is accomplished. The cut ends of the clavicles pass inward, and the bis-acromial diameter is accordingly diminished. If no further abnormalities exist, the shoulders are easily brought down by traction, with a blunt hook to assist if need be. Care, of course, is taken that the ends of the divided bone do not lacerate the mother's soft parts or the operator's fingers. Dr. Phänomenoff proceeds to relate a case where the operation was required to deliver the shoulders of a child which was found to weigh 5,300 grammes (about 11⅛ English lbs.) [I may add that I have divided the clavicle to deliver the body after craniotomy, and also to allow the arms to be brought down and, at the same time, give more room to reach the after-coming head before doing craniotomy. In each case I found no difficuly in breaking the clavicle with the craniotomy forceps.—E. H. L. O.]

Books, Pamphlets, &c., Received.

The Students' Practical Materia Medica, by Grace Haxton Giffen, L.R.C.P. and S.E. Edinburgh: E. & S. Livingstone. 1895.

Eyesight and School Life, by Simeon Snell, F.R.C.S. Ed. Bristol: John Wright & Co. 1895. (2s. 6d.)

Diseases of the Joints and Spine, by Howard Marsh, F.R.C.S. New Edition. London: Cassell & Co., Limited. 1895. (12s. 6d.)

Wright's Improved Visiting Lists—for 1895, and Perpetual. Bristol: John Wright & Co. 1895.

Modern Developments of Harvey's Work: The Harveian Oration, 1894, by T. Lauder Brunton, M.D. London: Macmillan & Co. 1894. (2s.)

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THE

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ORIGINAL ARTICLES.

LUDWIG AND PHYSIOLOGY.[1]

BY JOHN G. M'KENDRICK,
Professor of Physiology.

WE have met to-day to begin a course of lectures on physiology, the science treating of the phenomena happening in living beings. With the view of affording my students some conception of the nature and scope of the course, I have, on several occasions, given a sketch of the life and labours of a distinguished physiologist. This method of introducing the subject imparts to it the interest that we always associate with a great living personality, while it takes us away for a time from technical details and from the matter-of-fact statements of a text-book. On the present occasion I have chosen, as the subject of an address, a distinguished German physiologist, Carl Ludwig, who died in April last, and whose name will be inseparably associated with the progress of physiology during the greater part of the present century. This distinguished man, whose portrait is now before us, was not only an investigator of the first class, but he was a great teacher, in the sense of being an inspirer of men, and his pupils are to be found amongst the leading physiologists of the present day. He and his pupils have touched so many

[1] An Opening Address to the Class of Physiology in the University of Glasgow.

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questions in their physiological investigations as to make it certain that, if we try to follow in their footsteps, we shall obtain something like an adequate idea of what physiology is, and of what are its aims and problems.

Ludwig was born in 1816 in Witzenhausen. He received his university training at Marburg, in Hesse, and afterwards in Erlangen, and he graduated at Marburg in 1839, at the age of 22. His career was uneventful, and similar to that of any scientific man of merit in Germany. In his own university of Marburg he was a prosector in the anatomical department in 1841; a privat docent of Physiology in 1842; and he became Professor of Comparative Anatomy in 1846. In 1849 he was elected Professor of Anatomy and Physiology in Zurich, and he held that position till 1855, when he became Professor of Physiology and Zoology in an army medical school in Vienna. Ten years later, in 1865, he passed to the chair of Physiology in Leipzig, and he held this chair for thirty years, when he died in harness.

The first feature of Ludwig's career that I wish you to notice is that he approached physiology from the side of the sister science of anatomy. Almost every physiologist of eminence has done so. When we study the history of science, we find that the earlier anatomists were also the physiologists of their time. It is only in comparatively recent years that the sciences have been taught by separate teachers; but we must never forget that anatomy is the parent and the forerunner of physiology. If physiology has to do with the phenomena happening in living beings, we must first know something about the structures in which these phenomena are manifested. Thus, a careful study of the anatomy of the heart and blood-vessels must always precede a discussion of the mechanism of the circulation of the blood. So is it with every organ and with every function of the body. Nor do we depend here on naked-eye anatomy only, but with the microscope, and with the assistance of many beautiful methods, we unravel and describe the tissues of the body. All that relates to tissues comes under the subject known as histology, and it is all-important as the first step in understanding the functions of the elementary parts of which the body is built up. For example, you dissect a muscle in the anatomical rooms; you note its form, size, and attachments to bones; and, assuming that it is contractile, you are able to discover the part it plays in the mechanical movements of the limb. Thus you say the biceps flexes, while the triceps extends, the bones of the fore-arm at the elbow-joint. All this knowledge

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is anatomical. The next step is to examine the tissues of the muscle with the microscope, and you ascertain the structure of so-called striated muscle. This is histology. You are now in a position to study the changes that occur in a muscle when it is alive. You find that it contracts, that it is the seat of chemical operations, that it uses up oxygen and produces carbonic acid, and that it becomes warm. All this knowledge comes into the domain of physiology.

The separation of physiology from anatomy is, as I have said, comparatively a recent event. Up to the time Ludwig came to Leipzig, the two subjects, anatomy and physiology, were taught together by Ernst Heinrich Weber, so that it was only in 1865 that they were dissociated even in the great medical school of Leipzig. You will often hear me refer to the name of Weber. Two brothers, about fifty years ago, made important contributions to the physiology of the circulation, respiration, and the senses. The one, who was Ludwig's predecessor, died only in 1878, and I recollect seeing Ernst Weber at a "fest," or banquet, given in Leipzig in 1876. He was a man short in stature, with a thoroughly German cast of face, and he had long silvery locks straying over his shoulders. He sat beside the president of the banquet, whose name has escaped my memory, but I shall never forget the scene which took place when his health was toasted. In times of enthusiasm we may give a toast with Highland honours, but our excitement never approaches that witnessed by me on that occasion. Not content with shouting, many of the young men left their seats, rushed up to the head cross-table, behind which Weber was standing, and some of them clambered across the table, and hugged and kissed the old man. Each nation has its own way of showing enthusiasm. Such a demonstration was novel and striking to those of us who came from a country where we are not in the habit of embracing our professors, old or young. Possibly our insular coldness might, with advantage, be a little less severe.

Soon after Ludwig became a professor, he issued a text-book—his *Lehrbuch der Physiologie des Menschen*—and in that book we find the key-note of his future life. Up to the middle of the present century, with a few rare exceptions, physiologists endeavoured to reason almost exclusively from structure to function. The science was then founded solely on anatomy, and the anatomical method was deemed the surest guide. By and by it became apparent that living matter was the scene of many purely physical and chemical operations, and that it was of primary importance to

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scrutinise these operations and examine the organs or tissues while they were alive. So long as the anatomical method alone was followed, physiology abounded in vague speculation, or, in other words, men could only make shrewd guesses when an anatomical examination of an organ did not, and could not, reveal all its functions. It was also held that in all tissues there reigned a vital force—something quite peculiar, and distinct from all chemical and physical forces. The last great German physiologist who held these definite views as to the existence of a vital force was Johannes Müller, who was Professor of Physiology in Berlin; and it is a remarkable fact that the doctrine of "vitalismus," as it has been called, was finally abandoned by, at all events, the German and French schools, in consequence of the labours of three of Müller's distinguished pupils—Brücke, who became Professor of Physiology in Vienna; Du Bois Reymond, who now fills the Chair of Physiology in Berlin, and whose labours in the field of electro-physiology were epoch-making; and Helmholtz, who became renowned equally in the sciences of mathematics, physics, and physiology. Ludwig, although he was not a pupil of Johannes Müller, followed the lead of the younger men, and in his text-book he sought to eliminate all that belonged to the region of speculation, giving great prominence to what we may term the newer method. This consisted in the investigation of the phenomena of living things by the methods applicable to the sciences of physics and chemistry; and, from the data thus collected, physiologists endeavoured to explain these phenomena by the laws of physics and chemistry. Physiological phenomena were constantly referred to the chemical and physical processes with which they were associated. Every effort was made to give physiology her place among the experimental sciences—not experimental merely in the sense of being vivisectional, but experimental in the sense understood by the physicist and chemist.

I will give you three illustrations of this method of investigation, all closely connected with the labours of Ludwig and his pupils.

Perhaps there is no phenomenon more wonderful than the circulation of the blood. The fluid is propelled by a force-pump—the heart—along the arteries into the capillaries, from which it again returns to the heart by the veins. The heart itself is a living contractile pump, of complex structure, and furnished with valves that work with the greatest precision; the arteries are highly elastic and contractile

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tubes; the capillaries are so narrow in calibre as to permit the blood corpuscles to pass along in single file, and their walls are of extreme tenuity, so as to allow fluid constituents of the blood to pass out for the nourishment of the tissues; and the veins, with thicker walls, and often furnished with valves, are adapted for returning the blood to the heart. The force-pump works on night and day for many years without apparent fatigue, and we find that both it and the calibre of the arteries are under the control of the nervous system. One sees at once that, with each stroke of the heart, when blood is thrown into the arteries, the pressure in these vessels must be increased; and we are all familiar with the pulse-beat felt against the finger when we touch an artery.

The problem of the amount of pressure exerted on the walls of the blood-vessels by the blood, under various conditions, for many years occupied the attention of physiologists. In 1727, the Rev. Stephen Hales measured the pressure by inserting a long vertical tube into the crural artery of a horse. From the data thus obtained, many ingenious calculations were made by the physiologists of last century. In 1828, Poiseuille, a French physicist, used a mercurial manometer to measure the arterial blood pressure, the oscillations of the column of mercury being observed by the eye; and, in 1847, Ludwig converted the hæmadynamometer of Poiseuille into an instrument he named the kymograph, or wave-writer, by which the oscillations were recorded on a cylinder moved by clockwork. It was invented by Ludwig when he was in Marburg. This invention placed in the hands of physiologists an accurate instrument of research, by which all variations in the mean blood pressure can be faithfully registered, as you see by the tracings on the table which were taken by a kymograph made by Rothe, of Prague, now before you. It is seldom that an instrument springs *de novo* into existence. As a rule, it is a modification of another and less accurate instrument. This is true even of the kymograph, as it depends, as Ludwig himself stated in the account he wrote of the invention, "on a principle which was first employed by the celebrated Watt," referring to our own James Watt, whose mechanical genius took its first flights in the University of Glasgow.

The second example I shall give you of Ludwig's methods of research relates to the mode of the formation of urine. This fluid, as you know, is secreted by the kidneys, and it is stored in the bladder until it is voided. I need hardly point out that there is no urine in the blood, but nearly all the

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constituents of the urine exist in the blood. The urinary constituents—water, nitrogenous matters (such as urea), and salts—are, in some way or another, separated from the blood by the kidneys. While Ludwig was a privat docent in Marburg in 1842, he wrote his thesis, *Beiträge zur Lehre von Mechanismus der Harnsecretion*, in which he gave a purely physical or mechanical explanation of the process of urinary secretion, founded mainly on what he conceived to be the mechanical conditions existing in the kidney during the circulation of the blood through the organ.

With the view of understanding the problem, let us look at these anatomical conditions. The kidney is supplied with arterial blood by a large vessel, the renal artery, springing from the abdominal aorta. The artery, on penetrating the kidney, quickly divides and subdivides, as you see by this diagram, until it terminates in a series of arches in the part between the cortical and medullary portions. From the convexities of these arches, straight vessels run out towards the surface of the kidney. From these straight vessels, little vessels pass out almost at right angles, and there terminate in a plexus of minute vessels, termed a glomerulus, first discovered by Malpighi, an Italian anatomist, who flourished in the seventeenth century. From this plexus or glomerulus a minute vessel emerges, which again divides into another set of capillaries, and from these latter originate the radicles of the renal vein. The smaller rootlets of the renal vein unite and unite again with each other, to form larger and larger branches, until the renal vein is formed which carries the blood away from the kidney and empties it into the inferior vena cava. The tubules of the kidney — the uriniferous tubules — in which the urine is formed, are in close and peculiar anatomical relations with the blood-vessels just described. In the cortical part of the kidney, the region, be it remembered, in which the glomeruli exist, the uriniferous tubule is very convoluted, and it ends in a dilated sac known as Bowman's capsule, which surrounds the glomerulus. The glomerulus is lined by a double layer of epithelium, each epithelial cell being a flattened body; while the convoluted tube is lined by a layer of large, somewhat spheroidal cells, similar in general appearance to those found in a secreting gland. An inspection of these anatomical details at once suggests that certain constituents of the urine may be separated from the blood by a process similar to that of filtration under pressure. Thus, the minute calibre of the capillaries in the glomerulus, and the small meshes formed by the anastomosis of the

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capillaries, along with the fact that the efferent vessel of the glomerulus is narrower in calibre than the afferent vessel, all indicate that the blood pressure in the glomerulus must be high, whilst the pressure in the dilated end of the tubule must be relatively low. In these circumstances, as fluids will pass through a thin membrane from the side of high pressure to the side of low pressure, a purely physical theory of the mechanism of the secretion seems to be tenable. This was the view first propounded by Ludwig, and for many years it held its ground. Many experiments carried out by Ludwig and his pupils showed that the formation of urine depended largely, if not solely, on blood pressure. The mechanical theory was modified by Ludwig, from time to time, to meet the new facts that were brought forward by the experimentalists, but it was always, in the main, a mechanical or purely physical explanation.

This method of accounting for a physiological process by a physical explanation was much in vogue from 1850 to 1885, and it represented the rise and progress of a physical school of physiologists. It was applied to many processes, and it was confidently expected that some of the secrets of life would be unveiled by the methods of physics and chemistry. By degrees, however, and partly as a natural result from the chemico-physical theories being pushed as far as they would go, it became more and more evident that, in each process, there was a residuum of phenomena that could not thus be explained. It was also felt by many physiologists that all chemico-physical explanations left too much out of account the fact that, after all, the phenomena occurred in matter that was alive. To take the functions of the kidney as an example, we see that if the formation of urine is a physical process of filtration, it is a filtration through a living membrane covered with living cells. Further, the physical theory of filtration left out of account the larger cells in the convoluted part of the tubules, as no function was assigned to them in the process. Research soon showed that, in addition to the physical filtration process, there was the action of living cells, and that this action was selective in its character; the cells picking out of the blood certain matters and throwing these into the uriniferous tubules. Thus, after the influence of pressure had been experimentally modified—indeed, by so interfering with the nervous supply of the kidneys as to cause dilatation of the vessels, and consequently a great fall of pressure—a pigment injected into the blood was discovered in the urine and in the cells of the convoluted tubes—that is

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to say, the cells were seen in the act of separating the pigment from the blood. It was also shown that atropine paralyses the secretory action of the cells, whereas urea, when injected into the blood-vessels even when the blood pressure was very low, caused an increased secretion of urine, evidently by stimulating the activity of the cells. Further, it was found that the activity of the kidneys causes an evolution of heat, and that the amount of heat was in proportion to the amount of urea and other substances separated. All these facts point to the formation of urine being a process partly physical, as Ludwig held, and partly vital—that is to say, due to the activities of living tissues. So it is, as we shall see during our progress this session, with many other functions. It is a narrow view that relegates these functions solely to the play of chemical and physical forces. We are far yet from having explained the intricate molecular machinery of living matter. The processes occurring in a living cell are still beyond our ken, and these processes so modify the broader chemical and physical operations we find present as to lead us to hold that, while physiological processes are in all probability physical in essence, we must be content in the meantime with physical explanations that carry us on only so far, leaving a vast field still in the domain of what we term vital activity. Ludwig lived long enough to see the rebound from the purely physical explanation of phenomena in living tissues that was one of the characteristics of the physiology of his earlier years.

The third example of Ludwig's method that I shall place before you is the study of the effects of carrying on a circulation of blood or other fluid through an excised organ—that is, one entirely separated from the body—or through the blood-vessels of the rest of the body after an organ has been removed. The process is usually called that of perfusion. In his augural address in 1865, Ludwig pointed out the value of this method; and in after years both he and his pupils followed it out with marked success. The method is an attempt to imitate as closely as possible the conditions of life. It was applied, in the first instance, to the study of the heart, and I may say in passing that the physiology of this organ has been studied with more zeal and ingenuity and wealth of experimental procedure in the Physiological Laboratory of Leipzig than in any other place in the world. Adapting a little manometer to the excised heart of the frog, as you see in the experiment going on before you, and feeding the heart with an artificial blood, Bowditch, now Professor of

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Physiology in Harvard, showed that the frog's heart-muscle, quite independently of the strength of the stimulus, always gave a maximal contraction—that is to say, its beat was "all or nothing." Kronecker, now of Berne, showed that the heart-muscle could not be tetanized or thrown into cramp by rapid electrical induction stocks sufficient to throw any muscle of the skeleton into prolonged cramp. Dr. Coats, our own Professor of Pathology, who was an early disciple of Ludwig, showed how the work of the heart varied with stimulation of the vagus nerve, and numerous other researches on the frog's heart—researches of great importance not only to a clear perception of the physiology of the organ, but also because they helped to explain the action on the heart of many drugs—were carried out by Schmeideberg, Luciani, Kronecker, and many others. The same method of perfusion has been applied with great success to muscle, the liver, salivary glands, and the kidney. Nearly all the organs of the body may be so investigated. An interesting question suggests itself—Suppose we could feed an isolated brain with nutrient blood, what would be the result?

These are only examples of the work performed by Ludwig and by his pupils, but they are sufficient to show you some of the methods by which physiology has been advanced in recent years. As regards the man himself, the most appreciative estimate of his character and the best account of his labours is from the pen of my friend Professor Stirling,[1] of the Owens' College, Manchester, who long enjoyed his private friendship. Dr. Stirling writes:—"As a teacher of physiologists, he stood *facile princeps*. To use the words of his former assistant, Kronecker, 'No physiologist ever had so many pupils of all nationalities as Ludwig; more than three hundred scientific men owe to him at least part of their scientific education, and each one of them fell under the influence of his enchanting personality.' In every country of the world is to be found some one who has worked in his laboratory, and from 1865 onwards there was to be found a constant succession of English, and American, and other nationalities, who either wished to become physiologists or who wished physiology to be the basis of their future pursuits in practical medicine." . . . "There was a fascination about his manner and his discourse which was quite bewitching. For him the study of physiology was something more than the pursuit of a subject whose results had a direct practical

[1] "In Memoriam—Carl Ludwig." By William Stirling, M.D., D.Sc. 1895.

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bearing on the progress of medicine, and, therefore, on the material well-being of humanity; he prized it also for its relation to the fine arts, to music, to the doctrine of colour, and to progress in the study of language itself."

After an academic life of fifty-six years, he passed away. His own words, in an *éloge* he gave of his predecessor, Weber, are applicable to himself:—"Now he has been taken from us: although he has left us a rich inheritance, yet priceless good has gone with him to his grave. Every man on whom his eye, so bright with intelligence, rested, or who came under the influence of his conversation, or who felt the pressure of his hand, will grieve for him. Not the friend alone, but also those who may have differed from him, will mourn for the man in whom there was such a harmony between spirit and character—a man who united so much of the mental alertness of the student with the spiritual insight of the poet."[1]

Gentlemen, let us enter upon the work of the coming session with something of his spirit.

ON LUDWIG AND PASTEUR; AND ON VIVISECTION.[2]

By Professor JOSEPH COATS.

Before entering on the regular work of the session, and by way of an Introduction to the Course of Pathology, I propose to refer briefly to two men who have been recently removed from us—namely, Ludwig and Pasteur. Of both of these men I had some personal knowledge, and I will state later on some of my impressions of them. The names of both men also suggest a subject on which I think the British public needs enlightenment. I shall be pleased if some of that enlightenment comes through you.

Professor Ludwig of Leipzig was for many long years the principal representative of Experimental Physiology in Germany and, one might almost say, in Europe. As Professor of Physiology in the University of Leipzig he attracted to his laboratory men of every nation who had the desire to do

[1] Quoted by Kronecker. "Carl Friedrich Wilhelm Ludwig, 1816-1895." Von Hugo Kronecker, Bern. *Sonderabdruck aus der Berliner klin. Wochenschr.*, 1895, No. 21.

[2] These remarks formed part of the Introductory Lecture to the Course of Pathology of Session 1895-96.

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original work in Physiology. He inspired men to work, suggesting lines of research, and interesting himself in every step in the investigations. His desire was to base the facts of Physiology on exact data, and in the researches in his laboratory everything was done to make the observations self-recording, so that the results might be accurately measured after the conclusion of the experiment. It is largely due to Ludwig that the mercurial manometer and the kymograph have become the necessary instruments in physiological research.

Pasteur's is altogether a greater name than Ludwig's. It is a name which marks a new era in science. Trained as a chemist, and gaining his first laurels in this subject, Pasteur was drawn by the natural bent of his genius into lines which led him far into the problems of Pathology. When I say that, on the one hand, the whole subject of Bacteriology which has had such an enormous expansion in our day, and on the other hand, the whole of Antiseptic Surgery with its incalculable benefits to the human race, are ultimately based on the researches of Pasteur, you may form some estimate of the magnitude of his influence. Bacteriology has already had an enormous effect in enlarging our knowledge of disease, and it promises, by its exact methods, not only to advance our knowledge still more, but also to open the way to the effectual prevention and treatment of many diseases. Antiseptic Surgery, which its author, Sir Joseph Lister, has always ascribed, in its foundation, to the ideas of Pasteur, has already revolutionised surgery in warding off the serious and often fatal effects of wounds, whether accidental or by surgical operation. There can be no question, I think, that Pasteur's is, in biological science, and even in scientific medicine, the name of the century.

Now there is one subject connected with these two men to which I should like to allude. They were both what some persons are pleased to call Vivisectors, and this fact, even in the usually broad mind of the editor of the *Spectator*, seems to detract essentially from their merits. In so far as men are moved by sincere sympathy with animals, we must show respect to their feeling of aversion to the idea of operations on the living animal, however much we may condemn the methods which some of them adopt.

Gentlemen, there have been placed before the minds of men problems concerning the processes of life in health and disease, problems of vast importance to the human race. These problems demand investigation, and by the nature of

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the human mind there can be no pause in their investigation till they are solved. It is the part of the physiologist to approach them with a feeling of devotion and seriousness, and to use the means that are obvious for their solution. He admits his responsibility and recognises the necessity of conducting his enquiries with every consideration for the sensitive beings on whose bodies some of these investigations have to be made. He demands that liberty which pertains to all persons engaged in a legitimate line of endeavour, and refuses to admit that this form of research is less worthy of support than others.

There are various arguments put forward by those opposed to experiments on animals. I shall only touch on one of these suggested by the names of Ludwig and Pasteur. It is frequently asserted that such experiments brutalise the experimenter and lower the tone of feeling in mankind generally, and that any advantage to humanity which may be gained is more than counterbalanced by the disadvantage to morality. Let us look at this matter a little more closely. We demand of our opponents the admission that experiments on animals are done by men who have a serious object in view, whose aim is an entirely justifiable one—namely, to enlarge our knowledge of the processes of life in health and in disease. It is only the method of the investigations which can be objected to.

Take one or two analogies. Is it contended that the sportsman is brutalised by his pursuit of game? I confess for myself personally that I am averse to the killing of animals in what is called sport. My feeling of sympathy with the animals makes it abhorrent to me. I know, however, that in the minds of persons who engage in it there is a belief that the aim is a justifiable one, and I am bound to confess that, though I myself could scarcely engage in it without an evil effect, yet, that as a matter of fact, it does not seem to do any moral harm to those who engage in it.

This is, I think, a doubtful case, but a more pertinent one is that of the soldier. Here is a man whose business in life is to perfect himself in the art of killing and maiming his fellow-men. One would suppose that such an occupation would be brutalising in the extreme. If it be its own aim, then it is brutalising. The hired soldier, the mercenary, is certainly far from an exemplary person. But it is an unworthy calumny that the officer in the British army or the properly trained private soldier is brutalised by his occupation. Is it not the case that the bravest soldier is

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the kindest and gentlest of men? Have we not the extraordinary spectacle of a distinguished officer in the army amongst the ranks of the anti-vivisectionists? If a man is fighting for his country and for what he recognises as a just cause, there is not a degrading but rather an ennobling influence on his character.

Then take, as a final instance, what is nearest to the matter in hand—the case of surgical operations. Does any one contend that the surgeon who, in the prosecution of his duty, is called on to perform the most painful and ghastly operations, is degraded by doing so? Is it not rather the case that a strong humanity is developed in him, and that there is no more kindly and gentle person than an experienced and able surgeon?

To return to our original subject, my own personal experience enables me to say that in experimenting on living animals the attitude is exactly that of the surgeon. The aim is not so immediately and directly the relief of human suffering, but it is equally great and justifiable, in respect that it is the enlargement of knowledge by which the ills of flesh may be better understood and more effectually relieved. The operations on animals are similar, and they are conducted with similar precautions to those in man.

The two men whose names have been before us afford brilliant examples of what I have been saying. I spent five months in Ludwig's laboratory. I turned up there one day, in the month of May, a raw young graduate, who had learnt some German and had read Virchow's *Cellularpathologie*, but who could scarcely speak the language, and found it still more difficult to understand it. I had no introduction, but might have dropped from the skies on that day in May. Ludwig received me most kindly, immediately sent for a young Scotsman who was then working in the laboratory, and is now a leading London physician. I am pleased to know that the friendship begun that day lasts on to this. With my new friend as an interpreter, I was made welcome to the laboratory; and without any ceremony, without any credentials except that I was a graduate of Glasgow University, I was set down to do a piece of work which, I am glad to say, opened up my way in the paths of exact science. Ludwig was the kindest and most simple-minded of men. His sympathy with the animals under operation was quite that of the surgeon for his patient. I remember well how he inculcated on us the greatest consideration for the animal, and on one occasion checked me for having made an incision a little

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longer than was absolutely necessary. Ludwig's memory lives in his pupils as that of a kind and generous father, full of sympathy and of that humour in which sympathy and kindliness are so often half-concealed and half-revealed.

My acquaintance with Pasteur was much more limited. I have met him at dinner, and been beside him in his Institute at Paris. You must have noticed how the newspapers have dwelt on his private and domestic virtues, how goodness and kindness were his prominent characteristics. Can you read this man's will without having a glimpse into a character true, simple, sincere and kind? Here it is in its entirety:—"I leave to my wife all that the law permits me to leave her. May my children never neglect the law of duty, ever to preserve towards their mother the feeling of tenderness which she deserves." How touching also is the incident related in the *Times* in its obituary notice:—"When he went to London, and the memorable gathering, presided over by the Prince of Wales, was held to receive him, he kept modestly behind among the crowd. When invited to mount the platform, accompanied by his son-in-law, M. Valléry-Radot, the whole meeting rose as he began ascending the steps with his back to the people, and cheered enthusiastically. Thereupon he turned to his son-in-law, and said, 'The Prince of Wales must be arriving,' not imagining that the plaudits were meant for himself." On the occasion on which I met Pasteur at dinner, his son-in-law took my wife down to dinner. She found him brimming over with enthusiasm, not for the greatness of his father, but for his goodness and kindness and beauty of character.

During three weeks which I spent in the Pasteur Institute in Paris, I used to see him almost daily in the halls set apart for the inoculation for the prevention of rabies. He was present there taking a kindly personal interest in the patients. If there was any wound to dress he would give his attention and advice regarding it. I well remember the last time I saw him. It was on a Sunday, and I had gone to the Institute to say "Good-bye." I found Pasteur along with a tall, strong, ruddy man, who had a wound on his arm, to which Pasteur was attending. The man was obviously a Briton, and, as he could speak no French, I was asked by Pasteur to interpret. I found he was a Scotsman—a Highlander with the familiar name of Macgregor.

Those who came in contact with Pasteur could not but feel as I felt, that they were in the presence of a man of the deepest humanity, in whom was no trace of self-seeking—

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a nature altogether simple, sincere, and beautiful. And yet this man's work lay daily and hourly in what is called vivisection. Gentlemen, if any procedure involving suffering is justifiable, then surely the great aims and the great results of Pasteur's work are a demonstration that such experiments are so; whilst the character of this great man is a complete refutation of the imputation that such experiments do moral injury.

These two instances are by no means solitary ones. I can claim acquaintance with many, both in this country and abroad, who, in prosecuting their researches, call in the aid of experiments on living animals; and I am here to say that, both in their feeling towards the animal kingdom and in their general human feeling, they compare favourably with mankind in general.

You will observe that I have dwelt only on one side of this question of vivisection. There are other cogent arguments, which I do not adduce; but I thought that the example of these two great and representative men afforded an opportunity for saying something on this single aspect of the subject. I cannot offer you a more useful aspiration than that, in the prosecution of your professional work, you may preserve a feeling of humanity, and of devotion to duty, equal to that of the men to whose characters I have called your attention.

A HISTORY OF THE CHRONIC DEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM.

By T. K. MONRO, M.A., M.D.,

Fellow of the Faculty of Physicians and Surgeons of Glasgow; Assistant Physician to the Royal Infirmary, and Pathologist to the Victoria Infirmary of Glasgow.

(*Continued from* p. 258.)

II. HISTORY OF PRIMARY SPASTIC PARALYSIS.

NOMENCLATURE.

Primary spastic paraplegia.
Primary lateral sclerosis.
Primary and symmetrical sclerosis of the lateral columns of the spinal cord (*Charcot*).
Spasmodic tabes dorsalis (*Charcot*, in contrast to ataxic tabes dorsalis).
Spastic spinal paralysis (*Erb*).
Erb's palsy.

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HISTORY.

FIFTY years ago, Abercrombie described a typical case of spastic paralysis, with involvement ultimately of the arms as well as the legs. The patient died of phthisis two years after the commencement of the disease, and no changes were found in the brain or spinal cord.[1]

If other cases of this kind were published, they, as well as this one, were overlooked by subsequent observers. For, imperfect as our knowledge still is of the anatomy of spastic paralysis, it is only twenty years since it first took a definite place in our Nosology as a clinical entity.

Speaking of chronic spinal meningitis, Dr. Gowers remarks[2] that formerly "it was inferred that chronic symptoms analogous to those which, when acute, are due to acute meningitis, were evidence of a chronic form. This was, therefore, assumed to be the cause of a group of symptoms, of which spasm is the prominent and dominant feature, which are now known to be due solely to a morbid state of the spinal cord itself, and to be consistent with a perfectly normal state of the membranes. Hence 'chronic meningitis,' as it was recognised twenty years ago, as a 'clinical entity,' has ceased to exist, or rather has passed into the pathological conception of 'primary lateral sclerosis.'"

There is little doubt, however, that Erb disentangled spastic paraplegia from a mass of clinical types which included many diseases besides chronic meningitis.

The occurrence of secondary degeneration of nerve-tracts after a lesion of the central nervous system was first shown by Rokitansky in 1847; but we are indebted still more to a later observer, Türck, for the anatomical knowledge that has been gained in this way. The latter (1856), after investigating the nature of secondary degeneration, published several cases in which degeneration of the pyramidal tracts was discovered without any gross lesion to account for it. Charcot published, in 1865, a case in which the lateral columns only were sclerosed. The grey matter and its cells were intact, but several of the anterior roots were atrophied.[3]

Erb was the first (1875) to separate spastic paraplegia as an individual type from the midst of a heterogeneous group of chronic nervous diseases.[4] His communication was based on about a dozen cases without any autopsy; in only two cases were the arms affected. The symptoms described included exaggeration of the tendon-reflexes. (The tendon-reflexes were first investigated by Erb and Westphal shortly before this.) In the light of Charcot's researches of 1865—

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which, however, Erb thought must have been carried out on old and complicated cases—the latter considered it probable that the lesion in his own cases was a primary sclerosis of the lateral columns.

In a lecture delivered in 1876, Charcot gave a full account of the disease, which he called "spasmodic tabes dorsalis," by way of contrast to what he termed "ataxic tabes dorsalis" (locomotor ataxy). He fully admitted that Erb was the first to investigate the subject thoroughly.[5]

Charcot took up, on the whole, the same attitude as Erb, but was, if anything, less certain about the morbid anatomy. He said that the cases where the symptoms during life and the appearances after death indicated lesion of the lateral columns, without participation of the anterior cornua, were all "old memories which have become indistinct, and require to be refreshed."

In the following year, Erb published another contribution[6] on the same subject, and speaking of the time before the date of his former article, used these words—"Von der wirklichen, primären, lateralen Sclerose, existirte in der Literatur nicht ein einziges Beispiel." Some sentences later, however, he qualified his words a little by adding, "am wenigsten bei uns in Deutschland." I have already pointed out that Abercrombie recorded the clinical features of a case as early as 1845, thirty years before the time Erb refers to. As, however, this author, though he suspected the existence of disease in the spinal cord, could find after death no trace of changes in either brain or spinal cord, this observation of his detracts in no way from the credit due to Erb as having been the first to indicate the actual seat of lesion.

Our knowledge of the morbid anatomy of Erb's paralysis is still scanty indeed. It so happens that in almost every autopsy on a case which, during life, has presented the symptoms of this malady, the changes have been found not to be confined to the pyramidal tracts. One reason of this defect in our knowledge is that the disease has so little tendency to shorten life; it is not associated with those secondary disorders of the urinary, respiratory, and other systems which often cause death in tabes, progressive muscular atrophy, &c.; and another reason is that the degeneration seems to begin at the lower end of the pyramidal tracts—viz., where the fibres divide and form delicate arborisations and plexuses in the grey matter around the motor cells of the anterior horns; this is, of course, the region where the fibres are furthest removed from their nutrient cells in the cerebral cortex.

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III. HISTORY OF ATAXIC PARAPLEGIA.

NOMENCLATURE.

Combined lateral and posterior sclerosis.
Combined postero-lateral sclerosis.
Ataxo-paraplegic tabes (*Déjérine*).
Ataxic paraplegia (*Gowers*).
Ataxo-spastic tabes (*Grasset*).
Combined fascicular sclerosis.
Progressive spastic ataxia (*Dana*).
Postero-lateral spinal (or fascicular) sclerosis (*Damaschino*).

HISTORY.

Writers have hitherto generally traced back the history of this disease to the works of Prévost and others, in 1877, and of Westphal, in 1878. It ought to be mentioned, however, that Westphal described its occurrence in the insane at a much earlier date—viz., in 1867. Having already published a series of cases in which ordinary tabes dorsalis (posterior sclerosis) was associated with mental disease, he endeavoured, in an article, "Ueber Erkrankungen des Rückenmarks bei der Allgemeinen Progressiven Paralyse der Irren," to demonstrate that disturbances of motility in insane patients are due, not to brain disease, as had heretofore been supposed, but principally to disease of the spinal cord, which may sometimes extend up to the medulla and pons. Westphal's cases of spinal lesion in general paralytics included several examples of sclerosis of the lateral columns only, and three instances of combined sclerosis of the posterior and lateral columns. With regard to these latter, Westphal remarked

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that the gait was not such as is usual in posterior sclerosis—that the patients did not reel when they shut their eyes; but it must be borne in mind (he said) that the affection of the posterior columns was in the upper part of the spinal cord, and was slight in two of the cases.[1]

When Westphal was studying the knee-jerk, in 1875, he found it to be absent in tabes, and also in combined sclerosis, if the posterior sclerosis involved the lumbar region of the cord.[2]

Apart, however, from general paralysis of the insane, the principal early writers on combined posterior and lateral sclerosis were Prévost (1877), Pierret, Kahler, and Pick (1878), Westphal (1878), and Babesiu of Buda-Pesth (1879). Babesiu's case was one of sclerosis of the lateral columns, and of Goll's columns, with optic atrophy.[3]

An interesting article, from the pen of Damaschino, appeared in 1883. In addition to various other combined scleroses, he described cases of: (1) general paralysis with lateral sclerosis; (2) general paralysis with posterior sclerosis, lateral sclerosis, and optic atrophy; and (3) posterior sclerosis with lateral sclerosis. Damaschino said that this last combination was undoubtedly of more frequent occurrence than might be inferred from published accounts of it.[4]

A case of some importance was recorded by Ballet and Marie in 1884. There was sclerosis of the posterior and lateral columns with optic atrophy.[5]

Ataxic paraplegia owes its establishment as a definite morbid type, on both anatomical and clinical grounds, to the complete picture of it drawn by Déjérine in 1884 under the name of "ataxo-paraplegic tabes." Independent descriptions were given, two years later (1886), by Gowers and Grasset, each of whom proposed a new designation for this affection.[6]

Déjérine thought—at least when he first wrote on this subject—that the sclerosis began in the posterior columns, and spread to the lateral columns by way of the meninges. Westphal seems to have considered this possibility at an earlier date, and to have put it aside on the ground that the meningeal inflammation did not correspond, in situation and intensity, with the lateral sclerosis. He took the lateral sclerosis to be the primary lesion.[7]

An important paper on this subject was written by Dana, of New York, before Gowers's lecture on ataxic paraplegia appeared in print, but was not published till the following year (1887). Dana arranged his cases of what he termed

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"progressive spastic ataxia" into two groups: (1) those in which motor or spastic symptoms predominated, and (2) those in which sensory or tabid symptoms were more conspicuous. He thought that the typical lesion in this disease was a sclerosis of three long fibre-systems of the cord:—the columns of Goll, the direct cerebellar tracts, and the pyramidal tracts. A suitable designation, therefore, for the disease would be "combined fascicular sclerosis." A view similar to this appeared to commend itself to Strümpell.

Attention may be called to a later paper (1889) by Dana, who has by this time experience of fifteen cases. Though here (in a British journal) adopting the name proposed by Gowers, he is still inclined to think that the designation he originally employed is the more accurate one, because, in his experience, spastic ataxia is the leading symptom, whilst paralysis is but slight, in cases of combined posterior and lateral sclerosis.[8]

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[3] "Ueber die selbständige combinirte Seiten—und Hintersträngsclerose des Rückenmarks," Virchow's *Archiv*, 1879, Bd. lxxvi.
[4] "Des Affections associées de la Moelle et du Cerveau, et notamment des Lésions combinées des Cordons postérieurs et latéraux (Sclérose spinale postéro-latérale)," *Gaz. des Hôp.*, January, 1883, No. 1.
[5] See *Brain*, January, 1885, vol. vii, p. 556.
[6] Gowers, "Ataxic Paraplegia," *Lancet*, July, 1886, pp. i, 61. See also Ladame, *Brain*, 1890, vol. xiii, article "Friedreich's Disease."
[7] See Ormerod, "On the Combination of Lateral and Posterior Sclerosis in the Spinal Cord," *Brain*, 1885-86, vol. viii, p. 110.
[8] Dana, "Progressive Spastic Ataxia (Combined Fascicular Sclerosis) and the Combined Scleroses of the Spinal Cord," *New York Medical Record*, 2nd July, 1887, vol. xxxii; *Brain*, January, 1889, vol. xi, p. 490.

IV. HISTORY OF HEREDITARY ATAXY.

NOMENCLATURE.

Friedreich's disease (*Brousse*).
Hereditary ataxy (*Eisenmann*).
Postero-lateral spinal sclerosis of generic origin (*Everett Smith*).
Generic ataxy (*Everett Smith*).

HISTORY.

This disease was first separated from ordinary tabes by Friedreich, of Heidelberg, in an address delivered to the

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Congress of German Naturalists and Physicians in September, 1861. This communication was not published till 1863.[1] Meanwhile a remarkable case had been recorded by Marius Carré in a thesis published in Paris in 1862.

Friedreich's description of the disease was fairly complete. He noted the commencement with weakness of the lower limbs; the muscular inco-ordination, which was even greater than the want of power; the disturbance of speech; the spinal curvature, nystagmus, and giddiness; and the frequent commencement at puberty or in early adolescence. He also observed the deformity of the foot, and insisted on the etiological importance of alcoholism in the parents. He recognised the affection clinically as a chronic progressive loss of motor co-ordination; and anatomically as a chronic degenerative atrophy, mainly of the posterior columns, but also, to some extent, of the lateral columns, beginning in the lumbar region, and ceasing after reaching the medulla, and involving the nucleus and fibres of the hypoglossal nerve.

The disease, then, was at first regarded as a particular variety of the progressive locomotor ataxia of Duchenne. Friedreich said, in the account of his first published cases, that he considered himself entitled to separate this well-marked group (which consisted of two members of one family and four of another) from the general designation "tabes dorsalis." Some writers thought, after Vulpian and Charcot had described multiple sclerosis, that the hereditary form of ataxy was a variety of disseminated sclerosis, or a combination of this disease with locomotor ataxy.

Friedreich published two further contributions to this subject in 1876 and 1877.[2] In them he continued the histories of those of his patients who still survived at the date of his former article, and he also gave new cases. Of the total of nine cases, six suffered and five died from typhus abdominalis; and he therefore judged that ataxy must diminish the power of resistance to the onslaught of this disease. He noted how different, with regard to inherited predisposition, sex, and age, the hereditary was from the more usual form of ataxy. He found the tendon-reflexes abolished in the four cases examined. (These reflexes, which were only described by Erb and Westphal in 1875, were, of course, not known when Friedreich wrote on the former occasion.) One of Friedreich's autopsies was on a case of twenty-three years' standing.[3] Grey degeneration was found in the posterior columns and in the hinder part of the lateral columns. The spinal ganglia, peripheral nerves, and muscles

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of the extremities were normal. The medulla oblongata, especially in its lower part, was distinctly diminished in volume. It seems most probable, the author says, that complete formation and development of the cord and medulla did not take place, and that a sclerosis occurred in these defective structures. This sclerosis must have set in not later than the time when the first distinct morbid symptoms began.

The first time the disease was recognised and described in England was in 1880. In October of that year, before the Clinical Society of London, Dr. Gowers "brought forward five cases of locomotor ataxy in members of the same family, three of whom were exhibited."[4] Dr. Gowers alluded to the fact that, in 1871, Dr. A. Carpenter, of Croydon, showed two sisters, who were evidently suffering from this complaint, to the Medical Society of London. A brother in this family had since then become affected.

In 1882 an important study of Friedreich's disease was published by Dr. Auguste Brousse, who first named it after its discoverer. Brousse pointed out that the two sexes appear to be equally predisposed, and he distinguished the affection from tabes, from multiple sclerosis, and from the combined sclerosis of the columns of the cord which had been described by Prévost, Westphal, and others.

In 1883, Rütimeyer, of Basel, published a series of cases which were possessed of features so curious and interesting that they may be mentioned here. The eight patients belonged to four families named Blattner, and were all directly descended from one Blattner, who married in 1710. This common ancestor was known as Blattner Stülzi, "Stülzi" being equivalent in the vernacular of his district to "Stolperer" (English, "stumbler") in a less Doric dialect of German. Those of his direct descendants from whom the four families were derived were brothers about the beginning of this century. To distinguish this line of Blattners from other Blattners of the same village of Küttigen, all its members were called "Stülzi," not only in popular talk, but also in family Bibles and in official church registers. This continued till the fifth decade of the present century, so strongly had the stumbling gait of the original Blattner Stülzi impressed itself upon the memories of his contemporaries in the district where he lived.

Rütimeyer's eight patients were all born within the twenty years 1848 to 1868, and the youngest began to suffer twenty years after the oldest.[5]

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On the occasion of a clinical lecture at the Salpêtrière in 1884, Charcot showed a patient with hereditary ataxy, and expressed the view that this disease is different from both locomotor ataxy and disseminated sclerosis. Till then, apparently, he had never committed himself to an opinion on the nature of the cases described by Friedreich.

Reference may be made to a paper by Dr. Ormerod, "On the so-called Hereditary Ataxia, first described by Friedreich" (1884).[6] Here may be found tables of the genealogical relations of about forty cases, with accounts of the individual cases in abstract, and the literature to date.

Another important account of Friedreich's disease is due to W. Everett Smith in America. He reported six cases in girls of one family, all the boys remaining unaffected. The first symptoms in each instance were: gastric disturbance and palpitation, followed by unsteady gait; ataxy gradually extending to the hands, the disease thereafter remaining stationary for an indefinite period. There was a well-established history of alcoholism in previous generations. One of the patients only began to suffer at the age of sixty-six.

At the meeting of the Society to which Everett Smith read his paper (9th June, 1885), Dr. Morton Prince reported a sporadic case of this disease. The ages, however, of the other children of the family were such that they might possibly yet suffer.[7]

In "Some Further Observations on Friedreich's Disease" (1888), Dr. Ormerod described some cases, and emphasised the fact that, while family proclivity is a distinguishing feature of the disease—the one that caused Friedreich to separate it from tabes—sporadic cases do nevertheless occur; and that, moreover, the symptoms are now so well known that such cases can be diagnosed. Dr. Ormerod also emphasised the etiological importance of the acute specific fevers, and of intemperance in the parents.[8]

Dr. Ladame's address to the Medical Society of Geneva[9] is a contribution of great value. While not, perhaps, containing much that is original, it is an admirable critical review of our present knowledge of the subject; and the bibliography which is appended (embracing over a hundred references) ought to be useful to those who are interested. Up till this date we have records of nine autopsies on authentic cases.

Finally, in September, 1893, Dr. J. Wallace Anderson described two cases (brother and sister) which, he said, were the first recorded in Scotland.[10]

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[2] "Ueber Ataxie mit besonderer Berücksichtigung der Hereditären Formen," Virchow's *Archiv*, 1876, Bd. lxviii; 1877, Bd. lxx.
[3] Virchow's *Archiv*, Bd. lxx.
[4] *Lancet*, 1880, vol. ii, p. 618.
[5] Rütimeyer, Virchow's *Archiv*, 1883, Bd. xci.
[6] *Brain*, April, 1884, vol. vii.
[7] The cases of Everett Smith and Morton Prince were published in the *Boston Medical and Surgical Journal*, October, 1885, vol. cxiii, pp. 361, 371.
[8] *Brain*, January, 1888, vol. x.
[9] Translated in *Brain*, 1890, vol. xiii.
[10] *Glasgow Medical Journal*, 1893, vol. ii, p. 168.

V. HISTORY OF PROGRESSIVE MUSCULAR ATROPHY.

NOMENCLATURE.

Progressive muscular atrophy (*Aran*).
Atrophic muscular paralysis (name given by Thouvenet and adopted by Cruveilhier).
Chronic spinal muscular atrophy.
Chronic protopathic spinal amyotrophy (*Charcot*).
Chronic anterior poliomyelitis (*Charcot*).
Chronic parenchymatous tephromyelitis (*Charcot*).
Progressive muscular atrophy of the Duchenne-Aran type (*Charcot*). *N.B.*—Charcot recognises as distinct from this the disease which he names "amyotrophic lateral sclerosis;" he places the latter in a group to which he gives the designation "deuteropathic spinal amyotrophies."
Progressive fatty muscular atrophy (*Duchenne*).
Cruveilhier's disease or atrophy.
Creeping, or partial, or local, or wasting palsy.
Chronic progressive polymyositis (*Friedreich*).

HISTORY.

In 1830, Sir Charles Bell recorded [1] a few cases of paralysis of the muscles of the extremities. It is very doubtful if any of them can be classed with the disease whose history is now being traced. One of them, at least, is undoubtedly an instance of primary myopathy.

In the following year, Darwall of Birmingham published [2] a series of cases, of which two, at least, appear to have been genuine examples of progressive muscular atrophy. Indeed, Darwall's description is so intelligible to a modern reader that it would seem quite fair to attach his name to the

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disease, instead of that of Cruveilhier, who wrote about it at a date so much later.

In 1844,[3] Bell published several new cases of muscular atrophy. Probably a few are instances of progressive muscular atrophy. He supposes these affections of the muscular system of the extremities to be connected in some way with the sympathetic system of nerves, and, through that system, with the bowels. This allusion to the sympathetic foreshadows the promulgation of a theory which is commonly supposed to be of much more recent origin.

Graves records[4] a case of muscular atrophy involving the left upper arm and the right fore-arm. Some uncertainty is, perhaps, attached to this case, owing to the fact that the disease was arrested, though not cured, by mercurial treatment.

Judging from some of the names that have been bestowed upon the disease, it might be inferred that the history of progressive muscular atrophy only began after the time of Graves's work. Aran's well-known paper, entitled "Recherches sur une Maladie non encore décrite du Système Musculaire (Atrophie Musculaire Progressive)," appeared in September and October, 1850.[5] Some details about this communication are of importance. Aran states that he had published, in *L'Union Médicale*, nearly two years before, the first case of the kind that had come under his notice. He acknowledges his immense indebtedness to his friend Duchenne for placing at his disposal all the facts that he (Duchenne) had collected, and for assistance so great, in investigating the muscular systems of his patients, that he simply could not have done without it. Aran acknowledges his indebtedness to the writings of Van Swieten, Graves (1848), Darwall (1831), Dubois (1847), but, above all, to the writings of Charles Bell and Abercrombie (1845). He brings together in his paper eleven cases, of which, however, we must, with our present knowledge, reject several; for cases that occur in early life, in several members of a family, and without anatomical changes in the nerves connected with the affected muscles, are now recognised as belonging to a different category. Aran gives a good description of progressive muscular atrophy, and concludes that it may occur apart from any lesion of the central or peripheral nervous system, and without any arrest of the circulation.

The next contribution that must be mentioned is one by Cruveilhier, "Sur la Paralysie Musculaire Progressive Atrophique."[6] As early as 1832, Cruveilhier had seen a lady

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who suffered from what we can now easily recognise as a combination of progressive muscular atrophy and bulbar paralysis. This patient died about a year afterwards, and Cruveilhier was astonished to find, at the *post-mortem*, no lesion of the central nervous system. Never before had he been so disheartened at the apparent helplessness of pathological anatomy in the case of certain affections of the nervous system. For a long time—viz., while he was associated with the Salpêtrière—he saw no other similar case; but after he became connected with the Charité, he saw several. The first that came to *post-mortem* was that of a lad aged eighteen.[7] Cruveilhier found the brain and cord healthy, the nerves as bulky as normally, and the muscles atrophied (April, 1848). He concluded that the cause of the palsy was in the muscles themselves; the muscles wasted, and the degree of weakness was exactly proportional to the amount of wasting.

Cruveilhier states that he took every opportunity of making known the results of these two autopsies. Thus, in his summer course of 1848, he lectured on "L'Atrophie Musculaire Primitive ou Idiopathique" as the cause of a certain variety of paralysis.

In the beginning of 1849, Duchenne communicated to the Institute a memoir on "Atrophie Musculaire avec Transformation Graisseuse," in which he said he was indebted to Cruveilhier for his knowledge of the morbid anatomy of this disease. Duchenne communicated to Aran the results of Cruveilhier's second autopsy; and, in September, 1850, Aran published his paper on "Atrophie Musculaire Progressive," with a collection of cases. On the recommendation of Cruveilhier, Thouvenet, his interne, took up the subject for his Inaugural Thesis, which was produced in 1851, under the title of "Paralysie Musculaire Atrophique."*

From a third *post-mortem*, which he made in February, 1853, Cruveilhier inferred that the primary lesion of progressive muscular atrophy was not atrophy of the muscles, but atrophy of the anterior roots of the spinal nerves. The case was one of combined spinal and bulbar muscular atrophy. The orbicularis oris, particularly in the lower lip, was atrophied, and the tongue had lost much of its muscular

* There need be no dispute as to the fact of Duchenne laying before Aran the results of the autopsy made by Cruveilhier, for it is stated more or less directly by all the parties concerned. To judge from their writings, they had no dispute among themselves, though this seems to be hinted at in an English publication.

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tissue. In connection with this, it was observed that the hypoglossal nerve was so wasted as to present a striking contrast to another nerve which supplies this organ—the lingual, which was well preserved. Cruveilhier put the pathological sequence thus:—diminution of nervous impulses, owing to atrophy of anterior roots; diminished contractility; muscular atrophy. Atrophy of the anterior roots, he thought, was independent of any appreciable lesion of the cord.

In 1853, Duchenne published a paper,[8] which is of interest (apart from the records of cases) because in it he tries to show the great value of localised electrisation in the treatment of this affection. He also discusses here the question how, in view of Cruveilhier's discovery, faradisation of the atrophied muscles can arrest, or even remove, the wasting due to atrophy of the anterior roots, and why this treatment succeeds in some cases and not in others.

It took fifteen years to get one step further on, but the position that was thereby gained was of the first importance. What was arrived at was the theory, which has been but confirmed by the searching criticism of almost a generation, as to the morbid anatomy and physiology of the central nervous system in relation to this disease. The first discovery of changes in the cells of the anterior cornua of the spinal cord has been credited in England to Lockhart Clarke,[9] and in other countries to Luys.[10] It is not absolutely certain that the discovery—so far as genuine progressive muscular atrophy is concerned—ought to be credited to either of these observers; but if one of them does deserve the honour, that one, it appears to me, is undoubtedly Luys.

Luys's paper, which appeared in 1860, was entitled "Atrophie musculaire progressive. Lésions histologiques de la Substance Grise de la Moelle Épinière."[11] The case was one of muscular atrophy in the left arm, the right being scarcely affected. The patient died of intercurrent pneumonia, and changes were found in the grey matter of the cord at the part corresponding to the nerve-supply of the affected muscles—viz., disappearance of many cells of the left anterior cornu, degeneration of neighbouring cells, and atrophy of the anterior roots. The details given of the symptoms were so scanty that Duchenne hesitated to admit the case as one of progressive muscular atrophy. Still, for the same reason, we are scarcely in a position to reject it.

On the other hand, the claim made on behalf of Lockhart Clarke is based on his reports on the morbid anatomy of three cases. The first (1861) was a very remarkable case, whose

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clinical features were recorded by Dr. Gairdner.* With regard to its genuineness, some doubt is introduced by the fact that severe pain was one of the most clamant symptoms. The changes observed after death included pigmentation of the cells of the anterior horns. The two other cases (1862, 1867) were not examples of progressive muscular atrophy. Duchenne and others have pointed this out, and probably no one will question the soundness of their judgment here. Of course the admission that these cases were not genuine does nothing to disprove the existence of a lesion in the anterior cornua in progressive muscular atrophy.[12]

Immediately after Clarke, mention ought to be made of Duménil, of Rouen, who recorded several examples of muscular atrophy, with damage to the cells of the anterior horns, and atrophy of the anterior roots. He added the weight of his influence to the side of the nervous as distinguished from the muscular theory of the disease. To explain the puzzling fact of the common absence of muscular wasting in the territory of the bulbar nerves in comparison with what occurs in other parts of the muscular system, he recalled an observation by Schneevogt, and suggested that the different relations between the sympathetic on the one hand, and the bulbar and the spinal nerves on the other, accounted for the discrepancy.[13]

Duménil attributed the progressive, fatty, muscular atrophy to nervous influence—namely, an influence emanating, not from the motor, but from other nerve-elements. He thought that one of his cases, in which the sympathetic nerve was profoundly altered (a case, however, which was not an example of progressive muscular atrophy), furnished conclusive evidence of the involvement of the sympathetic in this disease.

* It may be of some interest to you (Dr. Monro) to know what does *not* appear in print—viz., that my case (that of an old Scotch professor) was submitted in the course of one forenoon to *four* eminent London physicians; and the result of these four separate consultations and opinions was communicated to me verbally by the late Professor George Edward Day, of St. Andrews, who accompanied his colleague.

Of the four consulted (Copland, Burrows, Gull, and Todd), two thought it was lead-poisoning; two thought it was not.

Gull thought it was a spinal lesion in the region of the brachial plexus. Todd said, "If it's not lead, I don't know what it is." One of the others held out for lead so decidedly, that the poor professor was sent over to Aix-la-Chapelle to have it cleared out of him, and it was after all this that he came to me.—W. T. G.

Dr. Gairdner has recently informed me (verbally) that the doctors collected some gallons of the professor's urine and divided it into two parts. They sent one half to be examined at University College, and the other half to some other laboratory. The one analyst reported that the urine contained no lead; the other said it contained traces.—T. K. M.

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In a lecture delivered at the Salpêtrière, in June, 1868, Charcot expressed his belief that the so-called motor cells of the anterior cornua are the primary seat of mischief in progressive muscular atrophy and the spinal amyotrophies generally. Additional *post-mortem* observations and writings by Hayem (1869), Charcot and Joffroy (1869), and Duchenne and Joffroy (1870), established Charcot's doctrine on so firm a basis that it speedily found acceptance in the text-books.[14]

The idea that the great sympathetic nerve was one of the principal seats of lesion, if not the primary seat, has been variously attributed to Duménil (1867),[15] and, with more justice, to Schneevogt of the Hague (1854), who, in one instance, discovered an alteration of the splanchnic nerves. But I have already mentioned that Sir Charles Bell (1844) had recourse, at a much earlier date, to the same nerve for help in the solution of the same problem. Remak, Eulenburg and Guttmann were other advocates of the view that the sympathetic is responsible for the trophic disturbances. The writings of Charcot, Hayem, Duchenne and Joffroy (1869-1870), with the negative results—as regarded the gangliated cord—of a series of autopsies, appear to have been the agencies by which the death-blow was administered to the sympathetic theory.

Duchenne had taught, as early as 1849, that progressive muscular atrophy was, in the first instance, a peripheral disease. Aran, Virchow and Friedberg also considered the primary disease to be muscular. (But the case on which Virchow based his views is inadmissible, being a family case.)[16] Bell and Cruveilhier, on the other hand, believed that the nervous system was at fault. Unconvinced by Luys's observation (1860), Duchenne seems to have been first led to regard the disease as primarily spinal by Hayem's paper (1869); and, in the third edition of *L'Electrisation Localisée* (1872), we find him accepting the modern doctrine of the spinal origin of true progressive muscular atrophy.[17]

The current of opinion was now flowing strongly in the direction of the "nervous," and away from the "muscular" theory of the disease; yet the latter was not left without its supporters. One of the most determined of these was Friedreich of Heidelberg, who, in his large volume, *Ueber Progressive Muskelatrophie* (1873), stoutly opposed the view that the primary lesion was in the nervous system. He said the primary change occurred in the muscular tissue, the changes in the nerve-cells being secondary. In its pathological aspect, therefore, he considered the disease to be a chronic

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progressive polymyositis, and accordingly he would look upon pseudo-hypertrophy as nothing other than a modified form of progressive muscular atrophy. But Friedreich's cases are rejected by Charcot[18] on the ground that the reports are not sufficiently complete; and even Friedreich's countryman, Erb,[19] remarks that his "weapons were not sharp enough; he based on a series of cases that was sadly in need of proper sifting, and contained a good deal that was foreign to the subject, and his microscopic work was not equal to the requirements even of that time."

Conversely, in his lecture on progressive bulbar paralysis, Kussmaul speaks of "pseudo-muscular hypertrophy" as of central origin, and proceeding from an atrophy of the anterior cornua and their ganglion-cells.[20]

A well-known case (which Erb subsequently identified as belonging to the "juvenile" group) was recorded by Lichtheim in 1878. Here there was no disease of the anterior cornua, and Lichtheim's investigation of the case made him a strong advocate of the myopathic theory of progressive muscular atrophy. He emphasised the close relationship between this disease and pseudo-hypertrophy, but yet believed that, on clinical grounds, they must be separated. Even Lichtheim's paper did not, immediately at least, alter the direction of the flowing stream.

Progressive muscular atrophy had hitherto been accepted as an unity in itself. But influences had already begun to work which were destined to bring about, before long, considerable modifications in professional opinion. In the effort to preserve this unity, writers had gone beyond the plain teaching of morbid anatomy. The unavoidable disintegration that followed resulted, however, not in chaos, but in the establishment, on a firmer basis than ever, of a scientific as well as practically convenient classification of the muscular atrophies. This disintegration was brought about by the detachment of one small group after another from the originally single, large, and heterogeneous group. It is not surprising that the first series of cases to be detached from the muscular atrophies were those of the pseudo-hypertrophic group. Duchenne had from the first (1861) recognised this to be distinct from progressive muscular atrophy, though, as we have seen, Friedreich endeavoured, twelve years later, to unite the two forms again.*

* Duchenne published the first description of pseudo-hypertrophic paralysis in the second edition of *L'Electrisation Localisée* (1861). He described it under the title of "Paraplégie hypertrophique de l'enfance de cause cérébrale." At a later date he substituted for this designation the name now commonly employed, "Paralysie musculaire hypertrophique."

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In 1875, Leyden (then of Strasbourg) proposed to separate the "hereditary forms of progressive muscular atrophy" from those of the Aran-Duchenne type.[21] He pointed out the tendency of the hereditary form to commence in early life; to affect several members of a family, and especially those of the male sex; and to involve first the muscles of the lower limbs and sacral region. He also showed that the development of fat might mask a very considerable loss of volume of the damaged muscles. Leyden remarked further on the unmistakable resemblance between the hereditary and pseudo-hypertrophic forms. While suspending judgment on the question whether progressive muscular atrophy is primarily spinal or muscular, he remarked that all observations hitherto made seemed to indicate that pseudo-hypertrophy at least is of myopathic origin.

In 1879, Möbius[22] divided the chronic muscular atrophies into two groups: (1) hereditary—viz., pseudo-hypertrophy and Leyden's hereditary muscular atrophy; and (2) non-hereditary—viz., the Duchenne-Aran type. He said that though all our methods of examination may show that the brain and cord are quite normal in cases of the hereditary or degenerative type, we need, nevertheless, have no hesitation in looking upon this disease as a neuropathy, the primary flaw being central and not peripheral.

By this time, as Erb has remarked, neurologists had separated various secondary muscular atrophies from progressive muscular atrophy; and, in particular, those due to, or associated with, acute and chronic anterior poliomyelitis, multiple neuritis, syringomyelia, and articular affections. The originally single group, therefore, of the muscular atrophies had become greatly differentiated; and the series of cases to which the name of progressive muscular atrophy was still supposed to be applicable had become greatly curtailed.

In 1882, Erb detached from this attenuated group a third set of primary myopathies, which he termed the "juvenile form" of progressive muscular atrophy.[23] In cases of this type, the shoulder-girdle, upper arm, pelvic girdle, thigh and back suffer early, and the atrophy is often associated with true or false hypertrophy. Erb ranged, in one class, muscular atrophy of the undoubtedly spinal type (due to lesion of the anterior cornua); and, in another class, the hereditary, pseudo-hypertrophic and juvenile types. The question of the neuropathic or myopathic nature of the juvenile form must, he said, still remain quite open.

As early as 1855, Duchenne had shown that there is a

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particular variety of muscular atrophy which occurs in childhood. In 1872, in the third edition of *L'Electrisation Localisée*, he gave a new account of this "infantile" form, and pointed out that it begins in the face and is frequently inherited.[24] Erb did not deal with this form, but, in 1885, Landouzy and Déjérine published an important paper on it.[25] They included among its leading characteristics its commencement in infancy, its occurrence in families, and its tendency to involve first the face and subsequently the shoulder and arm. They therefore described it as the "facio-scapulo-humeral" type of "pure progressive atrophic myopathy." They mentioned the "facies myopathique" as one of its peculiarities, and they ranged the disease alongside the other three that had already been separated from spinal muscular atrophy.

Reference may be here made to one of the most important recent writings on the subject—Erb's lecture on "Progressive Muscular Dystrophy."[26]

Even an historical sketch would be incomplete if no allusion were made to a question which is still a matter of much controversy amongst neurologists—the identity or otherwise of amyotrophic lateral sclerosis and chronic spinal muscular atrophy. Charcot first taught that two distinct forms of progressive amyotrophy may arise from lesion of motor-cells: (1) protopathic, arising exclusively from the lesion in question; and (2) symptomatic, in which the nerve-cells are affected secondarily—consecutively, for instance, to a lesion of the white columns. This distinction was made as early as 1869.[27]

At a later date, Charcot emphasised this distinction still more strongly. He said that chronic protopathic spinal amyotrophy corresponded to the clinical type described by Cruveilhier, Duchenne and Aran. Here the spinal lesion is limited to the anterior cornua. On the other hand, chronic deuteropathic spinal amyotrophy has several varieties. The most important of these (amyotrophic lateral sclerosis) is characterised anatomically by symmetrical sclerosis of the lateral columns, with secondary damage to the cells of the anterior horns. Charcot admits, however, that symmetrical lateral sclerosis may occur without invasion of grey matter, and he says it is possible (though this is very doubtful) that a primary lesion of the grey matter may extend to the lateral columns.[28]

In 1885, the same observer again announced his belief in the existence of two forms of spinal muscular atrophy, both

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of them, of course, quite distinct from the primary myopathies which recent advances in medical science had shown to exist.[29]

Most modern writers have followed Charcot, but his theory has found two very powerful opponents in Dr. Gowers and Professor Leyden.[30]

Many more observations will be required before the point in dispute can be finally settled—namely, the point whether degeneration of the lower segment of the motor path ever occurs without coincident degeneration of the upper segment; or, in other words, whether every case which Charcot would have called protopathic spinal muscular atrophy is not, in fact, an example of what he would have called amyotrophic lateral sclerosis. The difficulty in coming to a decision is shown by the meagre results (so far as this question is concerned) of the careful investigation of a case recently published by Dr. Mott,[31] and the actual truth must still be looked upon as unascertained; but there is no doubt that the evidence from autopsies, even in the earliest recorded cases, is very strongly in favour of Gowers's view.[32]

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[5] *Arch. gén. de Méd.* (4e sér.), 1850, tom. xxiv.

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[7] Obs. VI in Aran's collection of cases.

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[20] "Ueber die Fortschreitende Bulbärparalyse und ihr Verhältniss zur Progressiven Muskelatrophie," Volkmann's *Sammlung Klinischer Vorträge*, 1873, No. 54. Translated by New Sydenham Society, in *German Clinical Lectures*, 1876.

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[29] Lecture reported in a French journal in March, 1885. Translated by New Sydenham Society, 1889, in third series of Charcot's *Lectures on Diseases of the Nervous System*. Charcot gives here a classification of the chronic neuropathic and myopathic amyotrophies, but a more detailed one is given by Landouzy and Déjérine in their paper published in the *Rev. de Méd.*, 1885.

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[31] *Brain*, Spring Number, 1895.

[32] See, *e.g.*, Kussmaul's Lecture on Bulbar Paralysis, *German Clinical Lectures*, New Sydenham Society, 1876, pp. 27, 30.

IDIOPATHIC ENLARGEMENT OF THE SPLEEN, WITH RECURRENT ATTACKS OF PURPURA.[1]

BY C. O. HAWTHORNE, M.B., F.F.P.S.G.,

Assistant Physician, Western Infirmary; Lecturer on Materia Medica and Therapeutics, Queen Margaret College; Clinical Assistant to the Professor of Medicine in the University of Glasgow.

CHRONIC enlargement of the spleen is a not uncommon event in a number of diseases to which children are liable, and its association with leucocythæmia, lymphadenoma, malarial infection, amyloid disease, and cirrhosis of the liver is generally

[1] Read at a meeting of the Glasgow Medico-Chirurgical Society, 14th October, 1895.

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recognised. It may also be present with the signs of inherited syphilis, and it is not infrequent to find it together with evidences of rickets. In the case recorded below, whilst splenic enlargement, both in duration and degree, is the leading clinical feature, there is an entire absence of all positive evidence to support a diagnosis of any of the above-mentioned conditions; and, on the other hand, the manifest depreciation of the child's health, and the occurrence of repeated attacks of purpura, point only too clearly to some morbid influence which is exercising its unfortunate power over a wide area of the tissue activities of the patient. What the nature of this morbid influence is seems beyond the reach even of conjecture, and we must for the present be content to record the facts of the case, and to speak, *faute de mieux*, of the splenic enlargement as idiopathic.

K. I., now 11 years of age, was brought to the out-patient department of the Western Infirmary in June, 1893, on account of general failure of her health and of a swelling in the abdomen. She had suffered from measles when an infant, and again when 5 years of age, but otherwise had been an exceptionally healthy child until September, 1891, when she had an attack of influenza. This was followed by jaundice and suppuration of the cervical lymphatic glands, her illness confining her to bed for nearly four months. She remained for some time in a weak state and very sensitive to cold, and in the early part of the winter of 1892-93 had an attack of purpura, which was confined to the lower limbs; there were no discharges of blood except slight bleeding from the gums. In January, 1893, her mother noticed that the abdomen was swollen. At an even earlier date the child had been subject to occasional diarrhœa, but there had never been any vomiting or complaint of abdominal pain. Physical examination at once revealed very considerable enlargement of the spleen, the lower or anterior extremity of the organ reaching almost to the middle line in front, and the inferior border descending to a line about 1 inch above the left iliac crest. Percussion placed the upper border, in the mid-axillary line, at the fifth rib. The tumour had a perfectly smooth surface, and was quite free from tenderness. On examining the hepatic region, the liver appeared to be slightly enlarged and its tissue unduly firm. Thus, the sharp anterior edge of the organ was felt below the costal margin, and was more definite and pronounced than is normal. The heart and lungs, to physical examination, were normal, and the urine free from albumen and sugar. The blood showed a few small-sized red corpuscles, but no

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increase in the number of white corpuscles: hæmoglobin, 50 per cent; red corpuscles, 65 per cent. The general appearance of the child suggested languor, and there were evidences of anæmia, the skin generally being pale with a faint sallow tinge; gums not spongy nor excessively vascular, but the lower incisor teeth were loose, and on moving them there was some inclination of the neighbouring gum to bleed. Odour of breath very disagreeable. No retinal hæmorrhages. No suggestion of rickets or of inherited syphilis in any part of the body, and no enlargement of superficial lymphatic glands other than a few firm glands near each angle of the jaw. She was at this time admitted as an in-patient, and remained for some weeks under observation, but without the emergence of any fresh facts throwing light on the nature of the case. Since leaving the hospital she has been seen at frequent intervals, and the physical facts of the case have remained without substantial change, but on three occasions (in addition to the above) she has suffered from purpura. The first attack, in July, 1893, was a slight one, petechiæ and ecchymoses being small and confined to the lower limbs; in February, 1894, a very severe and widely spread eruption of purpuric spots and bruise-like patches appeared; and in August, 1895, after the enjoyment of fair and even good health for a period of eighteen months, she once more became very listless and languid, and some bleeding from the gums occurred, this being followed in the course of a few days by a very free hæmatemesis. She has now recovered from the immediate effects of this, and, though pale, appears vigorous and active. It may be mentioned that the child's home conditions are favourable, and there is no ground for suspecting the existence of a scorbutic element in the case. There is one other child in the family, a healthy girl, two years younger than patient; there have been no deaths. Father and mother healthy; no miscarriages. Maternal grandmother and a maternal aunt died of consumption, and in August, 1894, a second maternal aunt died of Addison's disease after only a few months' illness. As implied in the above statement, treatment, as far as the splenic condition is concerned, has been quite unavailing, but the general condition of the child has always improved after residence at the coast, and iron and arsenic in full doses have appeared to exercise a beneficial influence. Indeed, for the most part, anæmia, since the child has been under treatment, has not been a prominent feature of the case, the blood usually showing about 70 per cent of hæmoglobin. Similarly the state of the general nutrition is, and has been, fairly satisfactory.

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The occurrence of purpuric symptoms in association with enlargement of the spleen has been observed by various authors, and the condition described under various terms. Eustace Smith [1] speaks of a "simple hyperplasia of the spleen," which may occur without any "sign of diathetic disease or constitutional weakness," and notes that in such cases petechiæ and bruise-like patches may be present in the skin, and that epistaxis is common. These patients, too, he says, are very sensitive to cold and liable to gastro-intestinal troubles. As bearing on the present case, it is worthy of note that Smith has recorded a case in which the splenic enlargement appeared after an attack of jaundice, and he has also observed it in patients with a recent history of measles. Dr. West [2] has observed splenic enlargement (not leukhæmic) in cases displaying a purpuric eruption and hæmorrhages from mucous membranes. Starr,[3] in an article on "Splenic Anæmia," which he defines as a condition of "marked anæmia, with no appreciable lesion save enlargement of the spleen," says that in such cases epistaxis and subcutaneous hæmorrhages may be present. The same author, when speaking of "Subacute Purpura Hæmorrhagica," [4] states that the disease may be protracted for weeks, months, or years by the recurrence of attacks at irregular intervals, and adds that "the spleen and liver are usually enlarged during the attack." Dr. Harlingen,[5] in discussing the same condition, remarks that "when hæmatemesis occurs there is usually some pain in the left hypochondrium with splenic enlargement." Griffith [6] describes a "Splenic Anæmia" with cutaneous hæmorrhages and epistaxis, and regards the enlargement of the spleen as the cause of the anæmia and hæmorrhage. Under the terms "Lienosis" or "Splenic Cachexia," Angel Money [7] places a condition characterised by "a simple hyperplasia of the spleen, anæmia, and an extraordinary cachectic tint of the surface," and states that with these symptoms may be associated hæmorrhages into the skin and from the nose and elsewhere. Henoch [8] describes "simple hypertrophy of the spleen" as by no means rare, and adds that with it is found a peculiar yellowish-white tint of the skin, and often "little blood-extravasations in the skin;" he has also observed exhausting hæmorrhages from the nose. As a rule, in his cases, the etiology could not be determined, but they were not cases of leucocythæmia. The case now recorded is manifestly very similar to the group described by Henoch, but it is to be remarked that the degree of anæmia has never been so extreme as is frequently noted in the so-called "splenic

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anæmia," whilst the enlargement of the spleen has been very considerable and very persistent. This contrast makes it difficult to believe that the splenic hypertrophy is the "cause" of the anæmia, a phrase which in any case cannot be said to convey much light. It seems more reasonable to regard all the symptoms as the result of a common cause, of the nature of which we know nothing, and to indicate our ignorance by describing the case as one of idiopathic enlargement of the spleen with recurrent attacks of purpura.

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AMERICAN NOTES—MEDICAL AND HYGIENIC.

BY JANE BUCHANAN HENDERSON, M.D. BRUX., L.R.C.P. &c.

DURING a recent short visit to the United States and Canada, I took the opportunity of visiting a number of general hospitals, asylums, and other public institutions, but as space will not permit me to enumerate everything I saw, and as a mere catalogue of names and places would not be appreciated, it is my aim simply to call attention to a few points that appear to be of general interest; omitting a description of those points with which most travellers would naturally be quite familiar. It may be well, as a preliminary remark, to remind the reader that each State in the Union is a self-governing body, and that each Province in the Dominion of Canada makes its own laws for local government, consequently a statement, which may be quite correct when made about one city or district, is not necessarily true about any other city or district on the American Continent. In consequence of this we find that the laws relating to the time required for medical studies vary very much in different localities—thus, in New York, four years of study are required—namely, four winter

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sessions and one summer session; in Ontario the licence to practice can only be obtained after five years of study. This appears to be a comparatively new regulation passed by the Ontario Medical Council, and having a rather anomalous result. The Toronto University and Trinity University, Toronto, have not yet altered their regulations so as to make them coincide with the provincial law, and they still bestow their degree of M.D., C.M., or M.B. respectively, at the end of a four years' course of study, so that it is possible at present for a graduate to hold the degree of M.D. of a local university of good standing, and at the same time be legally unqualified to practise in the city or province. Some States require the student to pass a preliminary examination, others do not require this. The State or Provincial examination, without which it is illegal to practise, does not confer a licence to practise in any other State or Province, so that a doctor changing his residence to another State would require to pass a fresh examination. The medical schools that were visited appeared to be very well provided with the necessary teaching appliances, and there seems to be no special reason why the preparation obtained there should not equal that obtained in our best British schools.

The New York Institution for the Instruction of the Deaf and Dumb is beautifully situated on Washington Heights, overlooking the Hudson River. It is a handsome building, with several detached blocks for the laundry, engine-house, and junior school. No expense is spared in keeping up a high standard of health and efficiency, in order to send the graduates out to fight the battle of life unhampered, either physically or mentally. There are about 400 scholars, some of whom are supported by their friends, while others are supported by the town or county from which they come. Being vacation time, the most of them were away, while the few who remained were playing at base-ball, and, as far as could be judged, seemed capable of holding their own as well as their more fortunate opponents. A splendid gymnasium has been fitted up with all kinds of apparatus, and each scholar has to undergo a physical examination, so that the most suitable exercises may be ordered for him, and the examination is repeated at regular intervals in order to test the improvement. A trained nurse is a regular member of the staff, and any cases of illness are immediately transferred to her care, while infectious cases are isolated in a separate building. A dentist, who is a lady, makes regular visits, and is responsible for keeping the teeth of the children in good order. The weekly

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washing must be quite a formidable undertaking, as it includes several thousand towels. We were told that each of the 400 scholars is allowed twenty-three towels each week—three every day and five on Saturday, the bath day. They are never allowed to use a towel twice. The object of this is to prevent the spread of ophthalmia, or anything infectious that might arise, and it is reported to be most effectual. In contrast with this may be mentioned a smaller school where three roller-towels, each about 2 yards long, were considered sufficient for thirty boys for two or three days. It would be interesting to have some authoritative statement as to the number of towels that should be supplied to each individual in public institutions.

Of the general hospitals visited, the one best known by name was the Johns Hopkins Hospital at Baltimore. It is a large red building with a dome, occupying a conspicuous situation overlooking the city. The wards are in blocks, connected with the main building by airy corridors. An octagonal ward was pointed out as a feature of interest, but the majority of the wards are of the ordinary rectangular shape. I believe the method of ventilation is something special. We noticed cage-like structures made of wire under each bed, which were probably protections over the points of entrance of the fresh air, but owing to the very uninteresting nature of the guide who escorted us round, our visit here was a most grievous disappointment. The screens used in the wards were of a very good design, being large enough to surround the bed, and yet very easily moved from one place to another. They folded in three. The centre leaf was a solid wooden frame running on little wheels with rubber tyres; the two outer leaves were very light in the frame, and were supported only by their attachment to the central woodwork; the whole was filled in with clean white curtains.

The Presbyterian Hospital in New York is new, and has been built with all the latest improvements, and antiseptic precautions are carried out to the minutest detail, regardless of trouble or expense. The hospital was destroyed by fire some years ago, and the wards now in use have been built since then. The wards and corridors have rounded corners, both at the ceiling and the floor, so as to allow no crannies for dust and microbes. The operating theatre is entirely of marble or slate, including the doors, which are solid blocks of dark marble smoothly polished. Muslin pads take the place of sponges as a rule; but when the ordinary sea sponge is used, it is not considered fit for use a second time. A dressing

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room for the nurses is provided, and they have to wear a special linen dress, made with sleeves reaching only to the elbow, whenever they attend a case in the theatre. Even the surgeon is looked after and provided with a special pair of rubber shoes to be worn in the theatre. The metal fittings and all the water-pipes are nickle-plated; the instruments are of the latest and most improved pattern; even the little block that is used to support the pelvis when applying a spica bandage has not escaped, but is made of metal and plated with silver. The mortuary is clean and spacious, and when a body is waiting for removal or examination, it is kept in a closed-in compartment, within which a strong draught of air, cooled by ice, plays around it. In the casualty department a special ward awaits the reception of cases of sunstroke, so that they can be treated promptly and effectively on admission. Most cases of sunstroke have an extremely high temperature—110° and upwards; the treatment is therefore aimed at reducing this temperature by rubbing ice all over the body, or in less severe cases, by means of a cold bath, and stimulants are administered to overcome the collapse. The ambulance system is worked in the same manner as the fire brigade system. The city is divided into areas, each area being served by the ambulance of a special hospital. The Presbyterian Hospital has three beautiful ambulance waggons. Horse and driver are always on duty, ready to respond at a moment's notice to any emergency. The horse stands outside the shafts fastened by a halter to the stable wall; when the electric gong sounds a police call, the halter is automatically loosened; the horse steps into his place; the harness drops down and is fastened by a single attachment; and before the sound of the gong has time to die away, the waggon is well on its way to the scene of accident or suffering.

The hospitals in America, like those at home, are supported to a certain extent by the voluntary contributions of the benevolent, but it is also a general rule that each patient shall pay while in the hospital. The scale of charges varies with the locality, and also with the style of accommodation provided. In New York, where everything is dear, the hospital rate is also high, so that, in the hospital I have been describing, a patient in the public ward is expected to pay 7 dols. a week; while for the private rooms the charge may be upwards of 40 or 50 dols. a week, and the patients in the private rooms pay a doctor's fee by arrangement in addition. A dollar is equal to 4s. sterling fully. In Philadelphia, in the Women's Hospital, the scale of charges is lower—14 to 20 dols. being

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the charge in the private rooms, without any additional fee for the doctor. In Canada, patients may be admitted to the public wards on payment of 2½ dols. In all cases, patients unable to pay may be admitted free, but, in some places at least, such cases are charged to the municipal authorities. In Canada it is not the rule to have any place corresponding to our workhouse or poor law infirmary; but as there is, in the cities, a fair proportion of infirm and indigent people, provision has to be made for them by private charity; and, if the form of charity meets with approval, a grant may be awarded out of the municipal funds. This system of combining private charity with municipal support appears to have a distinct advantage in preventing so much overlapping of agencies as we sometimes see, or imagine we see—where we find accommodation provided out of the rates and yet refused by those for whom it is intended, simply because it will cause them to feel they are paupers, while these very individuals are willing to take relief in any shape from private persons or private charities. There is, of course, another side to the question. As these private charities are not under the control of the municipal authorities, the magistrates cannot compel them to admit any particular case; neither can they compel anyone to remain there when they have been admitted. As a consequence, a few of these poor folks land in the common jail, simply because there is no place else for them. If they have no place of abode, and no visible means of support, they may be committed on a charge of vagrancy; and if no alteration occurs in their circumstances by the time the sentence has expired, there is nothing to prevent them being re-committed on a similar charge. Such cases are treated leniently in prison. If infirm, they may be treated in the prison hospital ward, and special diet may be ordered for them. It is said that some of the old men prefer the prison to the private homes, and ask the magistrate to send them there. In the prison there are more rules, so that they are less likely to be interfered with by their neighbours. The routine life is not disagreeable, and the knowledge that they are not at liberty to go enables them to settle down peacefully.

The Hospital for Sick Children at Toronto was built as a memorial of Her Majesty's Jubilee, and is a memorial worthy of the event. I need not stay to describe the handsome façade, the staircase decorated with stained glass windows, the airy wards, the well equipped theatre, with photographer's dark room leading off it, and which was seen to contain numerous well-made casts of interesting cases. In the hot summer

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weather this remains practically unoccupied, and patients, nurses, and resident doctors are transported to a home on the island, looking towards the lake, and receiving the cool, refreshing breezes from the water. When visiting this lake-side home one warm Saturday afternoon, the wards were almost empty, but we found plenty of little patients who had been carried out or wheeled out in their beds on to the wide verandahs, where they were able to enjoy the brightness and the breezes. This summer hospital has a theatre, where operations can be performed if necessary, and it has also a little school-room where the tedious chronic cases and the convalescents can have a few short lessons. While on the subject of the summer heat, I may mention a form of charity which strikes a stranger with the force of a novelty—I refer to the free distribution of ice to the poor people of New York. Ice in summer is usually regarded as somewhat of a luxury; but in New York it becomes a necessity, to prevent the too rapid decomposition of food and consequent danger to health. So one of the newspapers (the *Herald*, I think) has started a fund to provide the ice, while the *Tribune*, not to be outdone, has a fund for sending sick babies with their mothers to the seaside or country for fresh air for a day at a time.

In some districts where there is no hospital for infectious diseases, when a case is notified, the medical officer sends a large notice to be appended to the entrance door, stating the nature of the illness that exists within; and this notice has to remain conspicuous all the time that there is any risk of infection, so that if any strangers enter it is at their own risk. The colour of the paper, on which the notice is printed, varies with the disease. I cannot supply a list of the various colours used, but I saw the scarlet fever notice printed on a sheet of red paper. In some cities arrangements are made for the immediate bacteriological examination of all cases of suspected diphtheria. The examination is carried out by the health officers, and, from a notice which was posted up in a public dispensary in Philadelphia, I read the instructions issued to the medical officer of the dispensary on this matter, and from this I gathered that the apparatus necessary for obtaining the specimen, and for packing and conveying it to its destination, were to be obtained at the nearest police office.

There are many other topics which might be considered interesting, but, as it would extend this paper unduly, notice of them must be postponed in the meantime. I can only express a hope that the preceding notes will be considered worthy of perusal by those who have visited America, and by those who have not yet done so.

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CURRENT TOPICS.

ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW.—The Directors of this Hospital have recently made the following appointments:—Walter K. Hunter, M.B., B.Sc., and Alice J. M'Laren, M.D., B.S. Lond., as Extra Honorary Physicians in room of Charles Workman, M.D., resigned, and John H. Carslaw, M.D., deceased; L. R. Sutherland, M.B., Pathologist; John F. Barr, B.Sc., M.B., Assistant House Surgeon; and S. English, M.B., Dispensary Surgeon.

GLASGOW SOUTHERN MEDICAL SOCIETY.—At a meeting of this Society on 3rd October, the following gentlemen were elected Office-bearers for Session 1895-96:—*President*, Dr. Alex. Rankin; *Vice-President*, Dr. David Tindal; *Treasurer*, Dr. J. C. Edmiston; *Secretary*, Dr. T. W. Jenkins, 1 Newark Drive, Pollokshields; *Editorial Secretary*, Dr. J. Gordon Wilson, 1 Aytoun Road, Pollokshields; *Seal Keeper*, Dr. David Couper; *Governor of Victoria Infirmary*, Dr. James Dunlop; *Court Medical*, Drs. John Brown, Alex. Napier, J. Lindsay Steven, T. Lapraik, J. Walls White; *Extra Members of Council*, Drs. C. E. Robertson, T. Richmond, G. W. Thomson.

GLASGOW OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.—At the first meeting of the Session, held in the Faculty Hall, the following Office-bearers were elected:—*Honorary President*, Sir J. Williams, Bart., London; *President*, Dr. G. A. Turner; *Senior Vice-President*, Dr. Malcolm Black; *Junior Vice-President*, Dr. J. Nigel Stark; *Treasurer*, Dr. Alex. Miller; *Secretary*, Dr. Robert Jardine; *Reporting Secretary*, Dr. A. W. Russell; *Pathologist*, Dr. John Lindsay; *Members of Council*, Drs. Kelly, Cullen, Gunn, Jenkins, Reid, and Munro Kerr.

GLASGOW EASTERN MEDICAL SOCIETY.—This Society opened the session for the ensuing winter on 9th October, when the following members were elected to their respective offices:—*President*, Dr. William Patrick; *Vice-President*, Dr. Alex. Patterson; *Treasurer*, Dr. Thomas M. M'Murray; *Secretary*, Dr. James Craig; *Editorial Secretary*, Dr. David Couper; *Extra Councillors*, Drs. William Findlay, George R. Mather,

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John Wilson, William Carr, Robert M'C. Service, Alex. Munro, James Dunlop. A motion by Dr. Service, that three members of the Council retire annually, was unanimously accepted, as was also one by Dr. Munro, which provides that the retiring President shall be *ex-officio* one of the Council.

"EDINBURGH MEDICAL SCHOOL CALENDAR."—The issue for 1895-96, a closely printed octavo volume of some 360 pages, published by Messrs. E. & S. Livingstone, is just to hand, and all the information likely to be of service to the Edinburgh student will be found in its pages.

UNIVERSITY OF GLASGOW.—The following have passed the *First* Professional Examination (New Regulations) for the degrees of Bachelor of Medicine (M.B.) and Bachelor of Surgery (Ch.B.) in the subject or subjects indicated after their respective names (B., Botany; Z., Zoology; P., Physics; C., Chemistry):—

George Alexander (B., C.), Andrew Aitken Barclay (B., Z.), James Freeborn Bennett (B., P.), Andrew Brownlie (B., Z., C.), George Frederick Buchan (P.), James Carruthers, M.A. (C.); George Morris Crawford (Z.), Charles Peter Garvie Crichton (B., Z.), Charles Cheven Cumming (B., C.), William Dick (B., P.), James Austin Dickie (B., B.), Frank Lindsay Dickson (B., P.), David Curr Douglas (B., Z.), John Pinkerton Duncan (B., C.), Hugh Campbell Ferguson (Z., C.), Comyn MacGregor Findlay (B.), John Andrew Garden (Z., C.), George Gardner (B., Z., C.), John Gardner (Z., P.), George Garry (Z., C.), William Gibson (Z., C.), Hyam Goodman, M.A. (B., Z., C.); Charles Aikman Gourlay (Z.), Nicol Jamieson (Z., P.), Andrew Kerr (C.), John Francis Lambie (B.), Norman Maclean Leys (B., P.), Andrew Love (Z., C.), Ramsay Millar (B., C.), Hugh Miller (B.), Norman M'Leod Miller (B., C.), Ebenezer Mitchell, M.A. (Z., C.), Daniel Morrison (Z., C.), Peter MacIntosh M'Fadyen (B., C.), John M'Gilchrist (B., C.), Charles Forbes Maclean (B.), George Todd Maclean, M.A. (B., Z.), Norman Forbes Macleod (B.), William Johnston Maclure (Z., C.), John M'Millan (Z.), William Seymour MacMillan, M.A. (B., Z., C.), John Patton (P.), Thomas Stephens Picken (B., C.), John Reid, Lanark (P., C.); David James Smith (B., C.), John Steele Smith (Z., P.), William Stewart Stalker (B., Z.), Peter Alexander Steven (Z., P.), Alfred George Stewart (B., P.), Thomas Morton Strang (P., C.), Robert Taylor (Z., C.), Charles Pinkerton Thomson (B., P.), William Brown Thomson (Z., C.), Joseph Swinburne Townley (P., C.), John Turnbull (B., Z.), Arthur Vost (B., Z., P.), Alexander Laurie Watson, M.A. (B., C.); Joseph White (Z., C.), Morgan Watkin Williams (B., C.), Alexander Wilson (B., C.), William Wright (B., C.), John Doctor Young (B., P.).

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Women Candidates.—Marjorie King Henderson Fleming (B., Z.), Helen Mary Gordon (B., Z.), Mabel Hardie (B., Z), Catherine Spence Howden (B., Z.), Jessie Sophia Beatrix Hunter (B., Z.), Ina Lochhead M'Neill (B., Z.), Maud Ada Richards (B., Z.), Elizabeth Helen Smith (B., Z.), Edythe Marjorie Walker (P., C.).

The following have passed the *First* Professional Examination (Old Regulations) for the degrees of Bachelor of Medicine (M.B.) and Master in Surgery (C.M.):—

Stewart Dunbar, George Munro MacLeod.
Women Candidates.—Martha Jane Gilmore Cox.

The following have passed the *Second* Professional Examination (New Regulations) for the degrees of Bachelor of Medicine (M.B.) and Bachelor of Surgery (Ch.B.) in the subject or subjects indicated after their respective names (A., Anatomy; P., Physiology; M.M. and T., Materia Medica and Therapeutics):—

Alexander Smith Allan (M.M. and T.), James Alston (A., P., M.M., and T.), George MacLellan Blair (M.M. and T.), John George Wilson Boleyn (A., P.), William Cochran Burns (A., P.), David Louis Cairns (M.M. and T.), Francis James Charteris (M.M. and T.), George Clark (A., P., M.M., and T.), Joseph Adam Clarke (M.M. and T.), George Coats (A., P., M.M., and T.), George William Coats (M.M. and T.), James Duncan Cochran (M.M. and T.), Joseph Muir Corbett (A., P., M.M., and T.), Robert Crawford (A., P.), John Crow (A., P.), Walter Scobie Findlay, M.A. (M M. and T.), James Finlayson Fleming (M.M. and T.), Adrian Andrew Forrester (M.M. and T.), Thomas Bonnar Garvie (A., P., M.M., and T.), Thomas Hunter, M.A. (A., P.), Alexander Lawrie (P., M.M., and T.), Alexander Millar Lindsay (A., P.), John Watson Little (A., P., M.M., and T.), John MacDonald (M.M. and T.), Murdoch Macdonald (A., P.), James M'Haffie (M.M. and T.), David M'Kail (M.M. and T.), Laurence Abel Mackenzie, (A., P., M.M., and T.), James M'Queen, M.A. (M.M. and T.), James Service Ormond (A., P., M.M., and T.), John Reid, Glasgow, (A., P., M.M., and T.), Norman Emil Henry Scott (M.M. and T.), Robert Scott (A., P.), John Laird Simpson, (A. P.), Alexander Bankier Sloan (M.M. and T.), Samuel Macfarlane Sloan (M.M. and T.), David Steele Smith (M.M. and T.), John M'Callum Stewart (A., P., M.M., and T.), Donald Sage Sutherland (A., P., M.M., and T.), James Douglas Carnon Swan (A., P.), Matthew Logan Taylor (M.M. and T.), Daniel Rees Thomas (A., M.M., and T.), Walter Lewis Thomson M.M. and T.), William James Alexander Walker (A., P.), William Watson (M.M. and T.), John Wotherspoon (A., P.), William Wyper (M.M. and T.), David John Young (M.M. and T.).

Women Candidates.—Daisy Annabelle Bennett (A.), Mary Gardner (A., P.), Jane Lorimer (A., P.), Minnie Amelia Macfarlane (A., P.),

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Agnes Renton Robson (A., P.), Catherine Love Smith (A., P.), Jessie Hawkesworth Smith (M.M. and T.).

The following have passed the *Second* Professional Examination (Old Regulations) for the degrees of Bachelor of Medicine (M.B.) and Master in Surgery (C.M.):—

Andrew Phillips Aitken, Walter Colquhoun, M.A., William Duncan, Chas. Elphinstone Fleming, Jas. Millar, Jas. Rankin, B.Sc., Alexander Page Robertson, David Wallace Smith, Alexander James Thompson Swann.

Women Candidates.—May M'Mullen Pearson.

The following have passed the *Third* Professional Examination for the degrees of Bachelor of Medicine (M.B.) and Master in Surgery (C.M.):—

A. *Including Pathology.*—William Allen, James Mitchell Bonar, Hugh Borland, William Brown, James Butler, Hugh Calderwood, B.Sc., John Lindley Carstairs, M.A., Thomas Cochrane, Peter Latimer Leitch Craig, M.A., James Gardner, William Hansen, John Hepburn Lyell, Archibald Mason, Andrew Brown Murray, Norman Macnair, B.Sc., Robert Nelson, William Seaton Paterson, David Lyon Stevenson, M.A., Henry Hyslop Thomson, Andrew Colville Wilson, B.Sc.

Women Candidates.—Agnes Jane Anderson, Mary Philip Graham, Mildred Ransome.

B. *Not Including Pathology.*—Donald M'Gregor Campbell, John Arthur Clarke Doonan, John Sharp Douglas, Chas. Lowson, William Martin, M.A., John Irvine M'Millan, M.A., William M'Mullen Pearson, James Hood Rankin, James Rutherfurd Ratcliffe, Alexander Robertson, John Taylor.

NEW PREPARATIONS, DRUGS, &C.—Messrs. Burroughs, Wellcome & Co. send us specimens of ophthalmic tabloids of tropa-cocaine, for use in eye practice, as a local anæsthetic. The tabloids are said to dissolve easily in the lachrymal fluid, when the drug is dispersed over the eyeball. They also send samples of tabloids of sulphite of magnesium, suitable as a bactericide in throat affections. The taste of the tabloids is not objectionable, a feature of some importance as bearing on their administration to children.

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MEETINGS OF SOCIETIES.

GLASGOW MEDICO-CHIRURGICAL SOCIETY.

Session 1895-96.

Meeting I.—4th October 1895.

The President, Dr. W. L. Reid, *in the Chair.*

The President referred to the death of Dr. Carslaw, who had been a member of the Society for five years, and the reporter of their proceedings for four years. He had known Dr. Carslaw, in public and in private, as a Christian gentleman; and he heard of his death with sorrow and regret. He moved that a vote of condolence be passed, and it was remitted to the President and the Secretary to draw up a minute to this effect, and transmit the same to the relatives of deceased.

I.—FRESH SPECIMENS FROM A CASE OF CEREBRAL HÆMORRHAGE.

By Dr. C. O. Hawthorne.

Dr. C. O. Hawthorne showed, as fresh specimens, the brain, heart, and kidney taken from the body of a man, æt. 50, who had died on the previous day. The brain was the seat of a large recent hæmorrhage occupying the pons, and extending backwards into the cerebellum.[1] On each side it passed some considerable distance from the median plane. The arteries in the cranial cavity were highly atheromatous. In the heart the wall of the left ventricle was considerably hypertrophied, but there was no valvular disease. The kidneys manifested the appearances produced by chronic interstitial nephritis.

The patient, when seen two hours before death, was absolutely unconscious, markedly livid, and with all the limbs flaccid. The pulse was full and strong, but respiration had almost completely failed, there being merely an occasional inspiratory effort. Pupils dilated and immobile. A specimen of urine, withdrawn by the catheter, the bladder being distended, was highly albuminous. It was decided to perform

[1] Further dissection revealed the extension of the hæmorrhage through the left crus cerebri into the optic thalamus and internal capsule. A second hæmorrhage, of moderate size and recent origin, was also found in the right internal capsule.—C. O. H.

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venesection, and 28 oz. of blood were withdrawn from the right median cephalic vein, but without producing any appreciable change in the patient's condition. The only history obtainable was that the man had suddenly become unconscious when engaged in his work as a labourer.

II.—A PATIENT WITH IDIOPATHIC ENLARGEMENT OF THE SPLEEN.

By Dr. C. O. Hawthorne.

A report of this case appears as an original article at p. 354.

III.—A PATIENT WITH AN ABNORMAL CONDITION OF THE ARTERIES OF THE LEFT UPPER LIMB.

By Dr. C. O. Hawthorne.

This patient, a man æt. 45 years, was shown on accouut of an abnormal condition of the arteries of the left upper limb. The left brachial artery could be seen to divide into two branches on the inner side of the biceps muscle, at a point half an inch above the level of the internal condyle. The longer branch, representing the ulnar artery, pursued a superficial course in front of the muscles arising from the internal condyle, and, descending into the fore-arm, could be seen and felt immediately below the skin, as far down as a point 3 inches above the wrist joint. Below this the vessel was more deeply situated; but its pulsations could be appreciated in front of the wrist joint and to the outer side of the tendon of the flexor carpi ulnaris. The smaller of the two branches formed by the division of the brachial passed from its origin almost directly downwards for about half an inch, and then turned somewhat abruptly outwards, disappearing behind the bicipital fascia. Presumably it divided into the radial and interosseous arteries. The radial artery in the lower part of the fore-arm occupied its usual situation. The arteries generally exhibited degenerative changes; and their tortuous course, and the visible pulsations they displayed, rendered their course conspicuous in so far as they were placed in the superficial tissues. No other abnormality was detected in the arterial system. The course of the vessels in this case is similar to that figured in various anatomical works[1] amongst

[1] Tiedemann, *Plates of the Arteries of the Human Body*, plate xv, fig. 1; Quain, *Anatomical Plates*, vol. ii, plate 11, fig. 5; Quain's *Anatomy*, tenth edition, vol. ii, part ii, p. 445.

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the recognised abnormalities in the arteries of the upper limb.

Mr. H. E. Clark was very much interested in the case, and thought it rare enough to be noted. In his experience a high division of the ulnar is not so common as the radial, and the division is usually immediately below the axilla. The artery probably owed its tortuous course to its position in the subcutaneous tissue, and this position exposed the man to injury such as a cut, and fatal bleeding.

IV.—"WORD BLINDNESS AND VISUAL MEMORY."

By Dr. Hinshelwood.

Dr. Hinshelwood read a paper on the above subject, which will appear in a subsequent issue.

Dr. Sloan said this was an interesting case, and read almost like a romance. He asked if the patient's power to read raised letters was retained, because if he could recognise by touch the loss would be of visual and not word memory.

Dr. Wallace Anderson was delighted with the paper, and thought the subject had been treated by Dr. Hinshelwood in a masterly way. The possible lesions in this case opened up the whole subject of localisation of cerebral functions. One great feature in this case was the recovery of lost functions by careful and laborious education. One wondered if, as in lesions of the left frontal convolution, a similar functional activity was excited in the opposite cerebral hemisphere, or if the cells adjoining the lesion became capable of carrying on the work of the whole centre.

GLASGOW PATHOLOGICAL AND CLINICAL SOCIETY.

Session 1895-96.

Meeting I.—14th October, 1895.

The President, Dr. D. N. Knox, *in the Chair*.

The President referred to the death of Dr. Carslaw, and spoke feelingly both of his own loss and the loss the Society had sustained, and it was resolved that his remarks should be embodied in a minute and transmitted to deceased's relatives.

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I.—FRESH SPECIMEN OF A TUMOUR.

BY DR. REID.

The tumour shown was removed from a woman aged 28 years. At her confinement, nearly three years ago, no tumour was then detected. The uterus was jammed in the pelvic cavity on the right side, and the tumour was movable to a certain extent. On opening the abdomen the tumour was found to be covered with peritoneum. This was opened to enucleate the tumour. No pedicle was visible at first, but on displacing the tumour a fairly long pedicle was found. This was transfixed, ligatured, and cut well above the point of transfixion. The cut surface of the stump showed brownish matter, evidently kidney tissue, and at first it was thought that the kidney had been separated from the tumour. The tumour, after removal, was left untouched.

Dr. Knox regarded the tumour as a unique specimen, and proposed the appointment of a committee to examine it and report. Drs. Reid, Buchanan, and Workman were accordingly appointed.

II.—CONGENITAL ABSENCE OF THE IRIS.

BY DR. MEIGHAN.

Dr. Meighan presented a baby, 4 months old, the subject of congenital absence of the iris. The account will appear in full in a subsequent number.

Dr. Fergus never saw a quite similar case, but he took a great interest in the subject because of the alleged action of the iris in producing glaucoma by blocking the filtration angle. This theory was thought to have been disproved in a case recently reported of glaucoma accompanied by absent irides, but on subsequent examination it was discovered that there was a stump of iris behind the scleral portion, and that this could quite effectively block the filtration angle.

III.—SARCOMA OF THE SCAPULA.

BY MR. H. E. CLARK.

Mr. H. E. Clark showed a specimen of sarcoma of the scapula, and the patient from whom the tumour was removed. This case will be published together with two photographs showing the condition of the patient before and after operation.

Dr. Knox said he had assisted at the removal of two scapulæ. The first case was under the late J. G. Lyon at the

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Western Infirmary, and that case was fairly comparable to this one. The second case was under Dr. Patterson two or three years ago. Like the case shown, it involved the sub-spinous and sub-scapular fossæ, and was a typical sarcoma. The scapula only was removed, the arm being left hanging to the end of the clavicle. He was not quite sure if a bit of the acromion was left. One marked feature of these cases was the rapid recovery which took place; the tissue being in a highly trophic condition, rapid healing necessarily took place. He regarded these as sub-periosteal sarcomas, and explained the invasion of adjacent fossæ to extension from one fossa to the other by absorption or destruction of the thin bony plate.

Dr. Sutherland said he saw a case of Dr. Patterson's which was sent to the Western Infirmary eighteen months ago. In this case Dr. Patterson removed the end of the clavicle and entire upper extremity. The tumour invaded both surfaces. The microscopic structure was not round or spindle-cells, but was more a mixed variety, being made up of round cells of various sizes and giant cells with nuclei. The destruction of bone, hæmorrhage, and necrosis were very extreme. In the *Transactions of the Medico-Chirurgical Society* (London, 1890), Chavasse describes cases with a structure as detailed in Dr. Patterson's case. He had examined another case similar to Dr. Patterson's where there were secondary extensions to the lungs and liver.

IV.—SPECIMEN OF DISSECTING ANEURYSM OF THE THORACIC AORTA.

By Drs. Macharg and Brownlie.

Clinical Report.—J. M., æt. 54 years, night watchman, was admitted to the Victoria Infirmary, under the care of Mr. Maylard, on 11th July, complaining of severe pain in stomach and of great and increasing weakness of eight days' duration.

Past History.—He is suffering from paresis of right side of body and face, following a kick on the head from a horse many years ago. For some time he has had a hernia, and wears a truss. He had an attack of influenza in February last, from which he quite recovered. From then till the present illness he has been, he says, in perfect health.

History of Present Illness.—On the night of 3rd July, having gone to bed feeling well, he was awakened by a violent pain in the stomach. The pain continued constant for some hours, and was so severe as to cause patient to cry out.

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The next morning he had an attack of vomiting of green matter. The pain, though present, was not severe in the morning, but in the afternoon he had several very bad attacks. His friends, however, did not think he looked seriously ill. He was not specially pale, and did not complain of faintness. For the next six days he suffered from intermittent attacks of excruciating pain in the stomach and back. Meanwhile he had completely lost appetite, and was rapidly losing strength and flesh; his friends, too, noticed him to be becoming very pale. A medical man saw him on the 8th July, and then expressed no opinion and advised no treatment; but, seeing him two days later, sent him to the Infirmary. At the time of admission, his bowels had been moved slightly twice since the onset of illness, the last motion being two days before admission. He stated that he had passed flatus till the day before admission, when he had ceased to do so.

On Admission.—The patient is very much emaciated, with marked pallor and sunken appearance of face. He is in a collapsed and almost moribund condition. Pulse 130, very feeble; temperature, 98° F. Heart: Position normal; sounds weak but normal. Lungs: Front of chest showed nothing abnormal; it was not considered advisable to disturb patient in order to examine back of chest. Urine: Dark and cloudy, contains urates, no albumen. Liver: No enlargement. Abdomen: He refers pain to epigastric and upper lumbar regions. There is no rigidity of the abdominal walls, and no general pain on manipulation. There is distinct resistance and sense of tremor, with communicated aortic pulsation, in the epigastrium, extending to the left hypochondrium, and over the swelling considerable tenderness on pressure. There is some thickening in the right inguinal canal, but in this region no pain, redness, or other local symptom.

Diagnosis.—Such being the history and facts of the case, the diagnosis seemed not at all clear.

Intestinal obstruction was first considered. In its favour were the sudden onset and characters of the pain, the vomit on the morning of onset, the constipation for two and (according to patient's account) the absence of flatus for one day, and the thickening in the right inguinal canal. But, on the other hand, he had vomited only once, and his bowels had been moved twice since the onset of illness; there was no tympanitis, rigidity, or general pain and swelling of the abdomen; and there was difficulty in accounting for the local swelling and tenderness in the epigastrium.

A more probable explanation of the case seemed to be

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malignant disease of the pylorus, which had given rise to no marked symptoms until ulceration had gone on to perforation, with adhesions and localised peritonitis. In favour of this diagnosis was the localised swelling and pain and the age of the patient. But here, again, it was difficult to imagine that such an advanced stage of the disease was compatible with the good health of the patient up to the actual onset of urgent symptoms, and with the absence of evidence of secondary manifestations.

Stimulating treatment was prescribed, and morphia suppositories given for the relief of pain.

The next morning the patient's condition was somewhat better. He was looking better generally, and his pulse had improved in quality. He died suddenly, however, in the afternoon. Shortly before death he gave a cry, and a few minutes afterwards was found to be covered with a cold sweat. The pulse was fast and almost imperceptible, the breathing slow and sighing. Death occurred by syncope.

Remarkable Clinical Facts in the Case.—(1) Absence of symptoms until the actual rupture had taken place; (2) the slow progress of the hæmorrhage; (3) especially the abdominal nature of the symptoms, with the simulation of pyloric tremor.

Post-mortem Appearances.—The heart and lungs were normal, nor was there any evidence of pericardial or pleuritic lesion, either of the nature of lymph exudation or serous effusion. Behind the costal layer of the right pleura, however, there was a very large amount of semi-clotted blood, which had separated the serous membrane from the posterior wall of the thorax, and which formed a mass of about 7 inches vertical length and 1½ inches in thickness. When the abdominal cavity was opened, it was found that the right inguinal canal was large, and that there was attached to it a bag of omentum, which had undergone some fibrinous change, and which appeared to have been adherent for some time, as no sign of recent inflammation could be observed. The viscera (stomach, intestines, liver, spleen, and kidneys) were all healthy. When these were removed, the aorta could be examined in its whole length, and the areolar tissue round about it was seen to be infiltrated with clotted blood, the largest mass of which surrounded the orifices of the cœliac axis and superior mesenteric artery, and formed a tumour of about 2 cubic inches bulk. When the aorta was opened throughout its entire length, a large rent in the internal coat was seen at a line of about 2½ inches above the orifice of the cœliac axis. Above

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and below this the internal coat was separated for about 2 or 3 inches, while the middle coat was infiltrated with clotted blood as far up as the descending branch of the arch of the aorta, at which part there was a clot of the size and shape of a large almond between the two outer coats. The opening in the exterior coat was at the same line as that of the internal, and through this the blood had passed into the surrounding areolar tissue, whence part had worked its way behind the right pleura and part downwards through the crura of the diaphragm, to form the tumour round the cœliac axis above noted.

The signs and symptoms thus admitted of easy explanation. In the first place, it is hardly likely that the condition of the right inguinal ring had anything to do with the symptoms. The anæmia, the weakness, and prostration are immediately referable to the hæmorrhage; the tremor in the epigastrium and transmitted pulsation to the blood clot above described; while the latter, by its pressure on the great ganglia of the solar plexus, probably gave rise to the attacks of intense abdominal pain.

Dr. J. Lindsay Steven said this was a most interesting case, and not often met with in actual *post-mortem* work. There were specimens in the Museum at the Royal Infirmary, no doubt, obtained by his predecessors; but he had never met with a case, although he had made 1,256 *post-mortems* at that institution.

REVIEWS.

Law and Chemistry of Food and Drugs. By H. MANSFIELD ROBERTSON, LL.D. Lond., and CECIL H. CRIBB, B.Sc. Lond. London: F. J. Rebman. 1895.

THIS manual has been written for the purpose of providing a compendious treatise of the law and chemistry of food and drugs for those whose duty it is to administer the various Acts of Parliament dealing with this branch of State medicine; and it may be said, at the very outset, that the authors have succeeded very creditably in their task.

Up till now, the literature of public health dealing with this subject has been distributed in an irregular fashion over several works, but in none has it had the deliberate and

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incisive treatment of the present volume; so it is well calculated to fill the gap which has hitherto been felt to exist.

The general purpose of the book is to advise traders how to avoid and detect adulteration for their own protection; to counsel inspectors and others engaged in carrying out the provisions of the Acts regarding their legal technicalities; and, last of all, by providing the texts of these Acts with connoted judgments already given, to enable members of the legal profession to carry out more intelligently what must obviously be, to most of them, a very difficult task.

The book is divided into three main sections: the first dealing with a list of references to cases prosecuted under the Acts, with a list of the Acts themselves which are presently in force in the United Kingdom; the second, with the provisions of these statutes and the legal points upon which judges have based their judgments; and the third, with the chemistry of the commoner articles of food, more especially with reference to their usual adulterants. The list of cases, which is very copious and wide-ranging in character, does not, however, by any means embrace all of the important cases. Perhaps this was not to be expected. But we fail to note reference to one or two. Doubtless this is not due so much to want of diligence on the part of the authors as to the fact that, under the Sale of Food and Drugs Acts, the procedure is summary; and, unless a case is taken for appeal to a higher court, any account of it may not have greater publicity than in the pages of a local newspaper or a public health journal. Take one example of these omissions. At pages 35 and 327 the authors inform us that "tinned peas containing sulphate of copper" have been held to be injurious to health upon medical evidence, and the cases quoted bear out this view. But there is no allusion whatever to decisions of an opposite character—decisions, too, which are more recent in point of time than those quoted. We refer to the prosecutions in September of 1891, and in January of 1892, which were tried in this city, and in which—after expert evidence had been led, on both sides, of an exhaustive kind—judgment was given in favour of the defender. In the former of these cases, an appeal was taken to the Court of Session, but was dismissed, costs being given to defender. Again, in the summer of 1892, the stipendiary magistrate of Liverpool, after expert evidence, also gave judgment for the defender.

The table of statutes is very complete—some of them, indeed, being nearly obsolete.

In the chapter treating generally of adulteration and the

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extent to which it prevails, we fear that the authors have unconsciously exaggerated both the extent to which adulteration now prevails and the consequent national monetary loss. They take the report of the Local Government Board as the basis of their calculations, and from it they reckon, in the case of milk, for example, the percentage of milk samples which have been analysed and found wanting. They then proceed to take the average amount of dilution found in the condemned samples; and from a computed estimate of the total milk annually consumed by the population of England and Wales, they calculate the amount of water sold as milk. This, perhaps, is but a roughly approximate calculation; but, as a mode of calculation, it never can be other than risky and erroneous. Moreover, from the evidence recently given before the Committee dealing with the Adulteration of Food Products, the extent of adulteration would not appear to be so great. There is no need to exaggerate the extent to which adulteration prevails; it is, indeed, but too prevalent, as all who are practically dealing with the subject well know. The authors very properly point out the relations which subsist between adulteration and the public health, and they emphasise the very harmful effect which is likely to follow the feeding of infants on condensed milks of inferior brands, especially where the labelling informing the public that the contents are "separated" milk consists of almost microscopic lettering. This is intended to satisfy the letter, while evading the intention, of the Food and Drugs Acts.

The authors complain with reason that these Acts, intended for the protection of the public, are in many places not carried out by the representatives of the people; that Local Authorities and County Councils, in short, neglect this duty, and thus the Acts become a dead letter. They attribute this unsatisfactory condition to want of initial energy on the part of public health officials, and, in those places where the Act is carried out in a perfunctory manner, to the failure of magistrates to impose proper penalties after conviction, to inspectors who blunder in their work, and to present defects in the Food and Drugs Acts.

Some of these defects are very serious, and probably are the causes of the imposition of inadequate penalties; nay, they would appear even to operate unjustly. Take the case of a retail trader who purchases of a wholesale dealer an article of food which he sells as it has been sold him. The retailer is, perchance, visited by an inspector under the Act, who buys some of the article in question for analysis. The

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article does not satisfy the requirements of the Act, perhaps, and the retail seller is summoned under one or other sections of the Act, and, let us say, is found guilty and fined. It is no legal defence at present for the retailer to plead that he sold the article precisely as he got it from the wholesale trader, for he is told that, in order to have protected himself, he should have demanded a warranty of purity from the wholesale trader, which warranty would have been a good plea in bar of conviction. This, undoubtedly, is hard upon the retailer who has acted in *bonâ fides*, for his only remedy now against the wholesale dealer is an action for damages at common law. It appears to us that, while the Act was intended to strike at the original offender, the letter of it does not carry this interpretation. This is but one of several serious defects of the Food and Drugs Acts. Of others to which the authors draw attention, the following may be noted, viz.:—Want of definition of minimum penalties; the limitation of the Acts to articles of food or medicine, and the non-inclusion of disinfectants, antiseptics, cosmetics, etc.; the absence of definition of what constitutes proper labelling in the case of mixtures; and, probably more than all, the want of standards of purity in the case of milk, butter, cheese, &c.

The authors declare the necessity for amendment of both the Food and Drugs Acts and the Margarine Act on the lines above indicated, upon which all public health authorities are agreed.

In connection with the question of condemnation of the flesh of animals for public consumption, and the recognition of healthy and diseased carcases, the authors insist very strongly upon some immediate steps being taken by the Legislature to compel improved modes of meat inspection. In this we entirely concur. While probably Great Britain is far ahead of all the nations in other sanitary matters, we must shamefacedly acknowledge that in this we lag very far behind. Indeed, it may be said that the modes of inspection which presently prevail are but one step removed from no inspection at all. The authors put it that they are in a "deplorably unsatisfactory condition"; which is true. We therefore must, in this particular, borrow some excellent hints from our Continental neighbours.

It is true, indeed, that one of the most recent requirements of candidates for degrees and diplomas in public health, demanded by the General Medical Council, is the production of evidence of having practically studied the diseases transmissible from animals to man, and it is also true that one or

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two of the examining bodies require of candidates to pass an examination on the carcases of animals in a public abbatoir; but, after all, where is the candidate to receive facilities for such study? At present, indeed, it may be said that, with the exception of possibly two or three places, no such facility is afforded.

We have nothing but praise to offer regarding the manner in which the legal section of the book is written. The chapters on Statutory Offences, on Obtaining Samples and Seizure, on Analysis, which embraces the appointment and duties of analysts, and certificates of analysis, and the chapter on Legal Proceedings, are all characterised by lucidity and completeness.

Hints to Traders forms a very readable and, for the persons for whom it is especially intended, a very valuable chapter, since it gives sound advice regarding warranties, contracts, sales, and other such matters. To this section of the volume an excellent appendix is given of legal forms, informations, Local Government Board circulars, schedules, and of the texts of the less important Acts.

The remainder of the volume (about 160 pages) is devoted to the chemistry of the commoner articles of food. The object of the writer of this section, as we are informed in an explanatory note, was to enable the reader to assess roughly the worth of any article as a food; the effect of adulteration, either by abstraction or addition; and "to facilitate the better understanding of the principles upon which the methods employed for the detection and estimation of adulterants are based." This object is a very praiseworthy one; but we question whether the author has succeeded in attaining it. As the section is written, it will be too abstruse for the ordinary unscientific reader. What, for instance, will he understand by *di-nitro-naphthol*, or *aniline-azo-β-naphthol* (p. 325); or diazo-compounds (p. 326); or Reichert's process (p. 361)? On the other hand, the expert analyst or the skilled witness will here look in vain for that fulness of treatment which would satisfy; indeed, he could with good reason complain that he had but misspent his time. At the same time, we cheerfully recognise the difficulty which the writer must have experienced in writing upon a chemical subject for a mixed class of readers, for the risk is that he will fail to satisfy both classes, lay and scientific, as we fear he has done in this case. The following example will illustrate what we mean:—At p. 317 the author advises that "every vendor of milk should use the lactometer and creamometer," while

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on p. 419 he informs the said vendor that "the lactometer by itself is only of limited use," and that "the so-called creamometer is a very rough and, by no means infallible, guide to the quantity of fat in the milk." While he was writing for the lay reader the author probably felt that analytical methods were beyond him, hence the advice to use these unscientific and totally unreliable tests; but the scientific reader looms in view, and, in order to put himself right with that person, the author is compelled, in justice to scientific accuracy, to state their unreliability.

Be it observed that the above advice is tendered the milk dealer so that he may keep himself right with the law. But why should the author advise the performance of imperfect, nay, untrustworthy tests by an unskilled hand when he takes such pains to point out to the retailer the protective value of a warranty of purity from the wholesale dealer? This warranty of purity, indeed, is the key-note of the situation, and we believe that if traders were acquainted more fully with the Acts, and realised the value of the warranty, not only would the poorest retailer and the public be protected, but the punishment would then light on the proper person, and the object of the Act would be gained.

A fairly exhaustive index concludes the volume.

The work is well printed and tastefully bound.

Text-book of Forensic Medicine and Toxicology. By ARTHUR P. LUFF, M.D., B. Sc., Lond. In Two Volumes. London and New York: Longmans, Green & Co. 1895.

THIS work is a luminous exposition of medical jurisprudence, and from its concise yet comprehensive character, suited alike for the student and the practitioner of medicine.

The first chapter defines the subject and discusses very freely the legal requirements in dealing with cases. The following six chapters deal with questions connected with the dead body. In auscultating the heart, it should be remembered that this organ may occupy some other region than the normal. A safe rule is to auscultate the whole chest before deciding that the heart sounds are absent. With regard to the onset of rigor mortis, the time is given as from three to four hours, but in one case reported by Dr. Finlayson, rigor mortis supervened in fifteen minutes. Several interesting cases of instantaneous rigor are quoted from Dixon Mann

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(*Forensic Medicine and Toxicology*), and the importance of this phenomenon is pointed out in the differential diagnosis of suicide and homicide. With regard to contraction of the iris after death, observations were made by Drs. Finlayson and Williams which led them to think the action was not simply a muscular one. The statement of the author that atropine and eserine alter the pupil after death is inconclusive in this relation, as the iris retains its power of reacting to light for several hours, and these drugs also produce their effect on an excised eyeball. A careful account is given of *post-mortem* stains, and their difference from bruises produced during life are set out in a tabular form. With regard to sudden death in children, it might have been noted that this is sometimes due to displacement of the odontoid process. It may be true in some cases that blows in the epigastrium produce death through splanchnic dilatation of the abdominal vessels, but in a case we saw the symptoms of disturbed heart and lungs pointed more clearly to inhibition through the vagi. The deeply interesting subject of identity is wisely treated, depending, as it does, chiefly on anatomical data, only the more striking facts are detailed; in actual cases reference would be made to our standard works on anatomy. As regards the stature, the approximation between the stature of an individual and the transverse measurement taken between the extreme ends of the middle fingers, the arms being held outstretched in a horizontal position, is a doubtful guide. We have often found the stretch 4 inches in excess of the height. It might be safer to take the femur as ·275 of the stature (*Quain*, tenth edition). Chapter VII gives full details of *post-mortem* examination for medico-legal purposes. The remaining chapters of volume I are devoted to toxicology, and the different poisons are fully considered and described in the following order:—(1) The symptoms produced by the poison; (2) the treatment and antidotes to be employed; (3) the *post-mortem* appearances resulting from a lethal dose of the poison; (4) the fatal dose of the poison; (5) the fatal period or time that elapses before death occurs; (6) the tests by which the poison may be detected. Under nitric acid poisoning it might have been noted that the orange yellow stain is the zanthoproteic reaction of proteids. In death from this acid may not destruction of the blood corpuscles supplement blocking of the bronchial tubes and paralysis of the vagi? The author doubts the utility of iron preparations as an antidote in arsenical poisoning, and prefers rather early evacuation and washing out of the stomach. Under poisoning

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by copper reference is made to the occurrence of copper in the normal liver, kidneys, and blood, but according to Jaksch (*Clinical Diagnosis*, p. 115), traces of copper occur normally in every organ. Jaksch also states (p. 282) that along with diminution of urine there is albumen and blood, and indicates that an acute nephritis may be set up. Besides the sources of copper in cereals, quoted by the author, may be suggested the presence of coins. We have seen eighteen coins and three bronze keys gathered from the surface of a three or four acre field devoted to agricultural purposes, and their occurrence is fairly common in agricultural districts. Hydrogen peroxide is stated to be an effective antidote in prussic acid poisoning. Under alcohol no mention is made of Whitla's suggestion that liquor ammoniæ acetatis produces a sobering effect. In a recent case of partial unconsciousness from champagne drinking, we gave two ounces with the happiest effect. In the section devoted to alkaloids and other vegetable poisons a notable feature is the introduction of a number of illustrations of plants. The addition of colour would enhance their value to those whose botany may have become rather grey. Under opium the author condemns the walking about of the patient as tending to exhaust the vital powers. With respect to the difference between spotted-hemlock and fool's parsley in the absence of spots from the stem, besides the different involucel the leaves of hemlock are more cut up and are fairly characteristic of the plant. Under salicylic acid the sodium salt is mentioned, but nothing definite is said as to treatment. In a recent case where the pulse became feeble and the respiratory movements restricted, we quickly rallied the patient with strophanthus, caffeine, and alcohol. The author quotes a case from Stevenson, of an officer who died rather suddenly from alleged ptomaine poisoning. This case caused a great stir, and the proceedings were fully reported in the local papers. The inquest was adjourned. Meanwhile, we suggested to the deceased's military medical attendant that all the evidence pointed to death from malignant œdema. Material was accordingly submitted to an eminent bacteriologist, who found the bacillus of malignant œdema. Whether the bacillus was in the sardines and produced the ptomaines found by Stevenson, or obtained access to the body from its nidus in the earth can scarcely be settled now. The officer had been playing at football shortly before the acute illness, but we have a distinct impression that he was not first rate before he took the sardines. Death occurred suddenly, and wholly unexpectedly, while the medical officer had gone to procure medicine.

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Shortly after death the great swelling of the body burst the neckband of deceased's night shirt. This case can scarcely be quoted as an uncomplicated death from ptomaine poisoning.

Volume II deals with coloured stains, wounds, death from lightning, heat, cold, sunstroke, and asphyxia, questions connected with the organs of generation, insanity, and life insurance. Under tests for blood is the guaiac and ozonic ether one. Haliburton says this should be abolished, Dixon Mann says it is only to be accepted when it yields a negative reaction. In connection with tests for blood, it may be noted that a good plate is given in the frontispiece of the solar spectrum and six blood spectra. The arborescent markings on the surface of the body in death from electricity are stated to be due to erythema produced by repeated forkings of the electrical discharge.

In the treatment of the apparently drowned, Labord's rhythmical traction of the tongue is described. Under death from hanging, reference is made to cardiac action after death. Those interested in the subject will find two sphygmographic tracings in Balfour (*Diseases of the Heart*, second edition), taken after death by hanging, with dislocation of the neck. This was in 1879, four years before the observations quoted by Dr. Luff. In death from asphyxia, the author notes minute extravasations beneath the pleuræ, pericardium, and peritoneum. We have noticed also punctiform ecchymoses over the chest in an adult who was buried under a fall of earth, and whose body was not recovered for eighteen hours, and was then quite warm. Over 120 pages are devoted to questions connected with the organs of generation. This is one of the most important sections of the work, and the subject is fully dealt with.

The remainder of the volume, with the exception of a page or two on life insurance, is devoted to insanity as regards forms, diagnosis, and the duties of medical men. This is an excellent summary, and should prove highly useful to those who have not had practical acquaintance with the subject in asylums.

A good table of contents and a list of illustrations are given in both volumes, and a satisfactory index is appended to volume II.

Dr. Luff has produced a thoroughly satisfactory work, which is sure to be popular with all interested in the subject. The paper and text are excellent, and the general get-up of the book is highly creditable to the publishers.

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Edinburgh Hospital Reports. Edited by G. A. GIBSON, M.D., D.Sc.; C. W. CATHCART, M.A., M.B.; JOHN THOMSON, M.D.; D. BERRY HART, M.D. Volume III. Edinburgh and London: Young J. Pentland. 1895.

THIS third volume of the *Edinburgh Hospital Reports* is a highly successful one. It contains the records of many of the most interesting cases in the Edinburgh Hospitals during the past year, as well as some original articles on various subjects, both in surgery and in medicine.

Of the aims of this book we cannot speak too highly, for by its means much useful knowledge is retained to the profession which might otherwise remain unpublished.

We can only notice a few of the forty-two articles contained in this work, and for the rest we refer our readers to the book itself.

The first articles are devoted to an account of the New Craig House at the Edinburgh Royal Asylum, the Deaconess Hospital, and the Victoria Hospital for Consumption. These all seem excellent institutions, but it is the new hospital for consumption which interests us the most. We are glad to see that the medical profession is at last recognising that tuberculous diseases are infectious, and that they should not be treated in the wards of a general hospital. So it is with much satisfaction that we hear of this charity in Edinburgh, and judging from the account before us, it must be most complete both in its outdoor as well as in its indoor departments.

We hope it will be the forerunner of many other similar institutions throughout the country, and we quite agree with Dr. Philip, in urging for something to be done for dying consumptives, when he says that "it is one of the most distressing aspects of our modern civilisation, that hundreds of such patients are still permitted to die inch by inch, through many months, untended, or nearly so, a source of grave danger to their helpless families, and even to the community at large. This is a question, as it seems to me, for our municipalities and county councils."

The next article is on Gastric Flatulence, by Dr. Wyllie, and like everything that comes from his pen, it is delightfully written and well worth reading. Flatulence due to the "introduction of atmospheric air" is a subject too little known, and therefore the present contribution, with the several cases described, is of special value. We note also the analogy drawn to the wind-sucking in horses.

There are two articles on Appendicitis. In one, Professor

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Annandale strongly urges the removal of the appendix in cases of intermittent appendicitis. He considers the operation to be attended with little risk, and that it removes a condition which may result in risk to the patient's life. The other article is on the association of Rheumatism to Appendicitis, and is written by Dr. Sutherland. It forms, as it were, a sequel to the paper by the same writer, in the *Lancet* for 24th August, 1895. The conclusions, however, we cannot yet accept. We cannot conclude that because the appendix, like the tonsil, contains lymphoid tissue, that it should, in the same way as the tonsil, be liable to inflammation in rheumatic subjects—even although the author has found six rheumatic subjects who were supposed to have appendicitis. The cases recorded, nevertheless, are well worthy of note, and in future we shall hope to have the matter cleared up.

Dirt Eating in Children, by Dr. John Thomson, should be read by those interested in diseases of children. In the same connection we may mention the article by Drs. Hutchison and Elder on the Movements of the Fontanelle in Children. In infants, the physician counts much on the condition of the fontanelle as regards indications to treatment, and we recommend this paper for consideration.

We must also mention a very excellent paper "On the Characteristic Modes of Fatal Terminations in Multiple Neuritis," by Dr. Gibson and Dr. Fleming. The case here described is of great interest, and the thoroughness with which the microscopic examination of the nerves was carried out is worthy of much praise. We hope to hear more on this subject from the same writers at some other time.

Dr. Byrom Bramwell has a paper on the Thyroid Treatment of Myxœdema and Cretinism, viewed from the clinical aspect. The cases are well reported, and form a very complete series. It would have been of interest if a more careful examination of the blood had been made before and after treatment. Some of the French writers have described nucleated red blood corpuscles as being found in cases of myxœdema. These corpuscles, they say, disappear with thyroid treatment. We ourselves have never found these corpuscles in the few cases we have examined.

Dr. Bruce's article on the use of the Thyroid Gland in Insanity is also a useful contribution to the therapeutics of this drug. The results obtained are very encouraging.

The Clinical Study in Diabetes, by Dr. Ramsay Smith, we do not quite appreciate. Neither of the cases recorded seems

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to us to have been a case of diabetes, for in neither was the quantity of urine increased.

There are many other papers of much interest which, however, we have not space to notice. We shall conclude, therefore, by offering our congratulations to the editors, and in wishing success to the third volume of the *Edinburgh Hospital Reports.*

The Extra Pharmacopœia. By WM. MARTINDALE, F.C.S., and W. WYNN WESCOTT, M.B. Eighth Edition. London: H. K. Lewis. 1895.

THE value and convenience of Messrs. Martindale and Wescott's work has been so widely recognised that, in noting the issue of an eighth edition, it is scarcely necessary for us to do more than express our appreciation of the thoroughness which characterises the entire volume, and of the complete success which has attended the effort to bring the information fully up to date. For example, the practitioner will find exactly the information he needs in the new chapter on Antitoxins, Serums, and Lymphs; and the same remark must be made about the chapter on Animal Glands and Tissues as Therapeutic Agents. In the present issue, too, Mr. Martindale has included his analysis of the medicines ordered in 25,000 prescriptions collected from various parts of the United Kingdom and Colonies. We trust the results will engage the careful attention of the Committee occupied with the revision of the *British Pharmacopœia*, but for really accurate conclusions, a still more detailed set of observations is in our opinion necessary. Thus, it can scarcely be claimed that the selection of remedies by the profession in Scotland is adequately indicated by the analysis of 2,000 prescriptions as presented at a single pharmacy in Aberdeen. Mr. Martindale's table is an interesting study, and is a move in the right direction, but it cannot be said that it fully represents the prescribing habits of the profession in the United Kingdom, and therefore it ought not to be used as a safe criterion by which to determine deletions from the official volume. If, however, the range of observation were increased, we believe that the facts so obtained would form the best basis upon which the construction of the national Pharmacopœia could be placed. A volume constructed on this principle could always offer to the pharmacist a uniform and correct interpretation of the medicines ordered by the physician, which we regard as the

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main function of the Pharmacopœia. We trust Mr. Martindale will press his results on the attention of the Pharmacopœia Committee, with the work of which we are glad to know he is associated. The therapeutic expert, we believe, may with advantage be here kept in the background, and left to express his opinion and exercise his educating influence on the profession through those considerable and confident volumes to which we turn so hopefully—when life to us is young.

Elements of Practical Medicine. By ALFRED H. CARTER, M.D. Lond., F.R.C.P., Lond. Seventh Edition. London: H. K. Lewis.

WE know nothing of its kind to surpass this excellent little manual of the practice of medicine. To do the medical student justice, he cannot be expected to master a large treatise on each of the subjects of his final examination. It is too much to ask him to be able to discuss all the different theories that have been proposed to explain the phenomena of Cheyne-Stokes respiration, whose explanation no man knows, or even to enumerate the eighteen theories of the heart-sounds collected and given in *résumé* by MM. Barth and Roger some years ago. The present work does not deal with such minutiæ, and, if used in the right way, is well adapted to the needs of the student.

Without doubt, clinical teaching is the best mode of instruction, not only because what is thus learned is strictly true, but also because so many of the gateways of knowledge are taken advantage of, thus aiding the memory and educating the observant faculties. But there are two defects in clinical instruction which require to be remedied by books or systematic lectures. In the first place, there is many a disease which a student ought to be able to recognise when he meets with it, and which yet he may never once see during many months of hospital attendance. And in the second place, the phenomena of disease, and diseases themselves become, when presented to the student by his teacher in some systematic arrangement, more intelligible and more interesting. A small text-book, then, such as the present one, when used to supplement, and not to take the place of, careful clinical observation and note-taking, becomes of good service.

The steady demand for this work, of which seven editions have appeared in about fifteen years, proves how acceptable it

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is to a certain class of readers. The plan of this edition does not differ materially from that of earlier issues. A few paragraphs, dealing with rare diseases, are printed in small type, but the great bulk of the work is in large print, which will at once commend itself to the midnight student.

The section on diseases of the skin has on this occasion been written by Mr. Malcolm Morris, who gives a classification differing from that of many authorities. The grouping of these affections is as follows:—(1) those dependent on nervous disorder (including not only pruritus, &c., but the various forms of erythema, lupus erythematosus, rosacea, pemphigus, lichen, &c.); artificial eruptions—viz., (2) those due to occupations, and (3) those due to drugs; (4) those due to parasites, comprising (*a*) general inoculable diseases (scrofulodermia, lupus vulgaris, and leprosy), and (*b*) local inoculable diseases (scabies, favus, tinea, acne, elephantiasis Arabum, &c.). In addition to the groups mentioned, there are some diseases which are left unclassified, such as eczema, psoriasis, and pityriasis rubra. Moreover, diseases of the glands and of the epidermic appendages, as well as new growths and malformations (ichthyosis, &c.), are separately considered.

Even this classification, though it cannot find room for a disease which, like eczema, furnishes such a large proportion of the aggregate of cases of skin disease, may prove helpful to the student.

Gout and its Relations to Diseases of the Liver and Kidneys. By Robson Roose, M.D., LL.D., F.C.S., F.R.C.P.E. Seventh Edition. London: H. K. Lewis. 1894.

When a medical work reaches a seventh edition, it may be taken for granted that it meets some want. In this case it is probable that the articles on gout in the general text-books on medicine are regarded as too small, and the other books devoted to the subject as too large, so that a small volume, pleasantly written, is welcomed. Dr. Roose's work is practically a compilation. He condenses and discusses the views of the various men who have written exhaustively on the theories of gout; but he has no experiments or new observations to urge in favour of one view more than another. His own experience has led him to adopt Garrod's uric acid theory, with a very slight modification. From his large experience of this disease, his views on its treatment are of more value than his views on its pathology.

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Medical Handbook of Life Assurance, for the Use of Medical and other Officers of Companies. By JAMES EDWARD POLLOCK, M.D., F.R.C.P., and JAMES CHISHOLM, Actuary. London, Paris, and Melbourne: Cassell & Co., Limited.

THE fourth edition of this practical handbook of life assurance has just been issued, and will be found of great value to medical examiners connected with life assurance companies.

The duties of the chief medical adviser and medical examiners are clearly shown, and the chapters on the various diseases, with their consequent risks, are well written. The "extra charges" certainly do not err in leniency towards the proposer, and in these days, when competition between companies is so great, may call for modification. To the beginner in medical examination the "Typical Cases" requiring additional premiums will prove of great service.

We heartily commend this useful book.

Asthma and Chronic Bronchitis. By JOHN C. THOROWGOOD, M.D., F.R.C.P., Senior Physician to the City of London Hospital for Diseases of the Chest, Victoria Park; &c. A New Edition of *Notes on Asthma and Bronchial Asthma.* London: Baillière, Tindall, & Cox.

DR. THOROWGOOD is a believer, and very properly so, in the nervous origin of a great many cases of bronchial asthma. In this little volume he has discussed the various theories of that disease, and given his reasons for the faith that is in him. Having had a very long experience of the Chest Hospital, he has naturally seen a great deal of asthma, with and without bronchitis, and his chapters on treatment have, therefore, a special value.

Mentally Deficient Children: Their Treatment and Training. By G. E. SHUTTLEWORTH, B.A., M.D. London: H. K. Lewis. 1895.

THIS is an excellent little book, and will prove to be of great service not only to physicians attached to asylums and other institutions where mentally weak children are specially treated, but also to physicians of children's hospitals and dispensaries, to whom frequently falls the duty of advising parents on the treatment of these very painful cases. For a

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small work, the information contained is exceedingly full and complete, including a historical retrospect of the subject, as well as chapters on pathology, diagnosis, etiology, and treatment. The value of the book is enhanced by an appendix containing a full bibliography, specimen-lessons suitable for feeble-minded children, and a list of the institutions in this country where the education of such can be undertaken. We have every confidence in recommending the book.

Outlines of Practical Physiology: being a Manual for the Physiological Laboratory, including Chemical and Experimental Physiology, with reference to Practical Medicine. By WILLIAM STIRLING, M.D., Sc. D. Third Edition, revised and enlarged. With 289 Illustrations. London: Charles Griffin & Co.

THE present edition of this work does not differ in essentials from its predecessor, but many additions have been made, including in particular an appendix on recording apparatus, and numerous woodcuts. The book consists of two parts, the first of which deals with chemical physiology, and the second with experimental physiology. The first includes such subjects as the blood, urine and digestive fluids, which, of course, are of the first importance in clinical work. Much of the second part will interest the laboratory student rather than the physician. For instance, the sphygmograph and its teaching are not treated of at any length. On the other hand, the numerous experiments on the special senses might prove entertaining to many a lay reader.

The book is full of information, concise in its style without any apparent sacrifice of clearness, and may be heartily commended to all who study physiology, whether in the laboratory or at the bedside.

The Retrospect of Medicine. Edited by JAMES BRAITHWAITE, M.D. Lond. July, 1895. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited.

THE scope of this work is clearly defined on the title page as follows:—"A Half-Yearly Journal containing a Retrospective View of every Discovery and Practical Improvement in the Medical Sciences." A careful perusal of this work and collation with contemporary medical periodical literature clearly shows that the book is all that it claims to be.

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The older practitioner is too well acquainted with the work to require commendation of it, but to others we may say that here, in brief compass, may be obtained reference to many obscure points in the course, diagnosis, and treatment of the more common diseases and surgical affections. Ample discussion will be found of the more prominent subjects dealt with by societies at the present hour, such as the antitoxin treatment; uterine curetting; castration for the cure of hypertrophied prostate; and appendicitis.

The book maintains its high excellence, and it is not too much to affirm that a fairly correct history of the progress of medicine and surgery might be drawn from the complete issue of the work.

The Practitioner: A Journal of Practical Medicine. Edited by MALCOLM MORRIS. London: Cassell & Co., Limited. 1895.

THIS is a handsome volume of nearly 600 pages, comprising the January to June numbers of *The Practitioner* for 1895. Those who have read the journal in its previous form will appreciate the changes which have been introduced by the new editor, Mr. Malcolm Morris. A short account of the number for January will best indicate the nature of these changes. The first 43 pages are taken up by three eminent writers on Puerperal Albuminuria and Convulsions; the Gouty Heart; and Oblique Fracture of the Femur immediately above the Condyles. These are eminently practical papers, the second being specially valuable on account of its common occurrence and relatively scanty literature. In the following 10 pages, under the title of "The Month," the editor indicates the lines upon which he will edit the journal; reference is also made to the antitoxin treatment; to the General Medical Council; and to Dr. Wilks and Sir Andrew Clark. The next five pages are devoted to public health—the subject being "Board Schools and Infectious Diseases." Under the title of "A Medico-Literary Causerie," an eminently readable article is given on "Medicine and Medical Practitioners in Ancient Rome." Nine pages are devoted to reviews of books; then follow 17 pages on abstracts from foreign journals; two more on new inventions, &c.; and five pages of practical notes. Under this last many valuable hints are given on the administration of medicines, and several efficient and palatable formulæ.

In the subsequent monthly numbers the promise of the first is fully maintained. A good general index is supplied, by

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means of which ready reference can be made to the minutest articles in the text.

The editor deserves high praise for the thoroughly practical nature of the work, and the publishers for the excellence of paper, type, and binding. The strong personal element which the editor has infused into the journal will command for it a wide sphere of usefulness.

Transactions of the American Laryngological Association for 1894. New York: Appleton. 1895.

AMERICAN laryngologists have reason to be proud of their Association. In this record of last year's work, although there is nothing strikingly novel, the contributions are of a high standard.

There are only two anatomical papers. In one of these, Jonathan Wright compares papillary hypertrophy of the nasal mucous membrane to a true papilloma, and shows that the former is not entitled to the position assigned it by Hopmann amongst the papillomata. In the other, Harrison Allen refers to the effects of cretinism on the shape of the nasal chambers.

Ethmoidal disease at present engages a large share of attention: it is perhaps the chapter in rhinology in greatest need of development. Casselberry contributes a paper on nasal polypus and its association with ethmoiditis. Bosworth also writes on the subject, his communication being one of the most valuable in the volume. He regards ethmoidal disease as by far the most frequent of all diseases of the accessory cavities, and believes that a very large proportion of the cases of so-called rhinitis are really cases of acute ethmoiditis, and that such inflammation as may exist in the nasal mucous membrane is secondary to the graver and more distressing conditions of the lining membrane of the ethmoidal cells.

Several papers deal with antral disease, but they contain nothing new excepting Mackenzie's, describing a case—probably the first discovered—of aspergillus mycosis of the antrum. De Roaldes gives full details of a case in which the cavity was invaded by a compound follicular odontoma.

Dr. French presents his observations on some of the results of cutting operations on the nasal septum. His remarks are directed to the consideration of perforations and membranous adhesions. He holds that the former may be deliberately made without injury and with great relief in certain cases. The author expatiates lengthily on membranous adhesions;

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he points out that cut surfaces on the septum will become adherent to scar tissue on the turbinates made by the galvano-cautery at some previous time, and gives various precautions to be observed. But why not do away with these difficulties by using tinfoil or a vulcanite plug after the operation?

Dr. Rice, after having given metallic electrodes a trial in the treatment of nasal and post-nasal disease, expresses in reserved terms his opinion as to their value. He thinks that the cases in which they may prove useful will be those in which hypersecretion persists after obstructions and hypertrophies have been removed.

There are several other interesting contributions, notably, Neurotic Phenomena in Throat Diseases, by Dr. Porcher; and Etiology of Rheumatic Affections due to Tonsillar Disease, by Dr. Wagner. Some rare cases are also described.

The Guide to South Africa, for the Use of Tourists, Sportsmen, Invalids, and Settlers. Edited annually by A. S. BROWN and G. G. BROWN. London: Sampson, Low, Marston, & Co., Ltd. 1895.

THOSE who desire to inform themselves about South Africa, and are not prepared to purchase a copy of Mr. John Noble's *South African Hand Book*, will find in Messrs. Brown's *Guide to South Africa* a large fund of concise information.

Some 25 pages are devoted to "Climate and Topography," in which nearly all the territories south of the Zambesi have their peculiarities of climate epitomised. One map showing the rainfall, and another the physical features, enable the reader to intelligently study this section, which, to a medical practitioner is perhaps the most important in the book.

Tables of meteorological observations, taken in various parts of Cape Colony, in the Transkei, the Orange Free State, and Natal, show at a glance the mean maximum and minimum temperatures, and the relative humidity.

The book is so indexed as to lend itself to ready reference, and has much valuable information for those going to the Cape for the first time.

Perhaps the authors are inclined to see most things in South Africa through rose-tinted spectacles.

The maps are both meagre in the information they give, and not over accurate. They are not worthy of the book. One would express the hope that next year's edition will see an improvement in this respect.

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

DISEASES OF THE SKIN.

By Dr. A. NAPIER.

Treatment of Pediculosis Vestimentorum. By Dr. W. Allan Jamieson.—The treatment of this affection in hospital is easy—a thorough scrub in a warm bath for the patient, and disinfection for his clothes, the latter being accomplished by boiling such articles as can be submitted to that process; or even better, perhaps, by washing them in water to which some paraffin oil has been added, and by exposing the outer garments to superheated steam. In pediculosis corposis the best remedy is petroleum, which may best be applied in the form of a soap, such as Calvert's petrofenic soap (containing carbolic acid as well as paraffin oil); this is employed to wash the skin, the lather being allowed to dry on. To destroy the insects and their ova in the body-clothes, advantage may be taken of the property of sulphur of slowly subliming and becoming oxidised into sulphurous acid at the temperature of the body. A piece of roll sulphur the size of a pigeon's egg is enclosed in a porous bag made of muslin or canvas, and worn next the skin day and night. —(*British Journal of Dermatology*, August, 1895.)

Hidrocystoma.—Dr. James Adam, of Hamilton, publishes an interesting account of his experience of this affection in the *British Journal of Dermatology* for June last; and Dr. Alexander Morton describes a case of the same disease in the August number of the same journal.

Dr. Adam has seen nine cases, six in women and three in men. He thus details its diagnosis:—

"An eruption of discrete, deep-seated vesicles, confined to the face, never larger than a barleycorn, worse when the patient is sweating, and disappearing to a great extent when sweating is at a minimum, ought not to be readily confused with other conditions, once the disease is comprehended as a distinct entity. From lymphangioma cutis and benign cystic epithelioma of the skin (epithelioma adenoides cysticum) Hidrocystoma is distinguished by, amongst other points, the absence of congenital origin, by its limitation to the face, by its rising and falling according as the patient perspires or not; and by the same differences, except that both are limited to the face, it is distinguished from adenoma sebaceum. Pompholyx rarely occurs on the face, and is accompanied by heat and itching. Sudamina are so entirely superficial, and so readily wiped off, that they are not likely to be confounded with the firm, irremovable vesicles of hidrocystoma. The greatest resemblance is probably to epithelioma adenoides cysticum when confined to the face; but in that disease the little tumours are solid, at least at first, and do not vary in size or number with the perspiration."

He has gone carefully into the pathology of the disease, having examined over seventy sections, and finds that the lesion is one of the sweat-glands, that the fluid secreted is sweat, and that the cysts are not mere retention-cysts. The cysts arise *in* the coils, and their common mode of origin seems to be first a hypertrophy and then a dilatation of one or more turns of the coil. The true reading of the disease seems to be hypertrophy of the secretory part of the sweat-glands, without compensation in the excretory part for getting rid of the hypersecretion. Distension would result, probably most marked at the seat of the hypertrophy, or where the coil joins the excretory duct. When the excessive sweating had ceased, the secretion would be slowly

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discharged. Hypertrophy once started would tend to go on, as also the resulting distension with each free perspiration. This would explain the presence of the very rich epithelial lining, which is so thick as to be readily detached, or even to form an intra-cystic growth.

The Difficulties of the Treatment of Tinea Tonsurans. Henri Alexandre Martin (Steinheil, Paris, 1894), *Thèse de Paris.*—1. The author examines the various methods of treatment of tinea, and concludes "that there does not exist at the present time a satisfactory treatment for tinea tonsurans."

2. He gives a summary of Sabouraud's recent work, and accepts all his conclusions. From the doctrine of plurality of species it follows that such treatment cannot be specific, for there are many varieties of tondants, each of which requires a special therapeusis.

3. Since cases will ultimately recover spontaneously, it is not justifiable to employ methods which cause destruction of the hair-follicles, and which lead to the formation of a hairless cicatrix.

4. Unfortunately, of the methods at present known, those which spare the follicle are unable to attack the parasite, on account of the deep implantation of the hair and the narrowness of the mouth of the follicle.

5. The difficulty in diagnosis, especially of early cases, is pointed out. In the earliest stages the hair does not appear to be altered. The lesions may easily be confounded with seborrhœa, psoriasis, impetigo, &c. In suspected cases he advises that the head should be painted with tincture of iodine, for this not only enables one to confirm the diagnosis, but brings into prominence the earlier lesions, destroys them, and acts as a prophylactic to the further spread of the disease.

6. It is even more difficult to decide when a case is cured. A cure can only be declared when two careful examinations, at an interval of one month at least, do not reveal any parasite; even then one may be deceived.

7. The difficulties of treatment and the extreme contagiousness demand energetic prophylactic measures. The management of epidemics in schools is thoroughly discussed, and the establishment of State hospitals for isolation is strongly advocated. It is not sufficient, however, to isolate tinea cases; the different varieties should be kept apart.

8. In all cases the preliminary measures recommended by most authors should be carried out—viz., the head shaved, washed daily with soap and warm water, and kept covered by a bonnet or cap. In all cases the head should be painted with iodine for the reasons given above.

1. *Large-spored varieties of animal origin.*—The tendency of these forms is to cure themselves by a process of inflammatory diminution, complete alopecia not resulting unless the inflammation be very intense. The primary indication for treatment therefore is to control the irritation by meal poultices, which have also the advantage of removing crusts, &c. Where there is little or no folliculitis it is necessary to provoke slight irritation. This may be done by the application of an iodine ointment (3 to 20 in 100). The duration of these cases is from two to four months.

2. *Large-spored varieties of human origin.*—Treatment by irritants seems to be the best at the present time. The fungus in this form is almost exclusively confined to the hair, and epilation is recommended, together with the application of tincture of iodine and Vigo's plaster. Though complete epilation is difficult, yet one obtains a bald patch, allowing easier application of the plaster, and perhaps also the entrance of the iodine into the follicle is facilitated. The results of this method are to cause (1) a vesicular inflammation (2) or a deeply-seated exudation. These remedies act probably by producing a secondary pus infection antagonistic to the growth of the fungus.

In cases of fragile mycelium, where the hairs often do not pierce the integument, rendering epilation impossible, it is well to remove the superficial epidermis by means of shaving, scraping, iodine applications or collodions.

In those cases where there are no large plaques, but small groups of diseased

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hairs scattered over the whole scalp, gauze dressings appear useful. A thick cap of iodized wool can be applied to the head and covered with oilskin.

3. *Small-spored variety.*—Here there exists the same difficulty in epilation and the same impossibility of reaching the bottom of the follicle.

According to Sabouraud, the staphylococcus has no deterrent effect on the growth of the *microsporon*, and does not cause deep inflammation of the scalp. Martin entirely agrees with Sabouraud, and says, "we must, therefore, look for other treatment than that of irritative medicaments."

The best results have been obtained by the alternate application of tincture of iodine and a pomade of carbonate of potassium. The pomade facilitates the epilation of the hair, so that at the end of three weeks or so *by using great gentleness and care*, the hairs can be epilated almost or quite entire, and thus facilitating the penetration of the iodine into the follicle. The duration of this type under such treatment is not definitely stated.

4. *Treatment of the last stage of tinea tonsurans.*—In all cases, after arriving at a certain stage of the cure, there remain isolated spots of a few hairs which may resist all treatment. It is justifiable then to destroy these hairs by needling or electro-cautery.—(*British Journal of Dermatology*, June, 1895.)

The Treatment of Psoriasis with Large Doses of Potassium Iodide, with Remarks on Iodism. Dr. Seifert, privat docent in Würzburg (*Archiv für Dermat. u. Syph.*, Bd. xxvii, Hft. 3).—There are many theories on the nature of psoriasis, but not one settles the ætiology of the disease, still less forms a basis for successful treatment in all cases. Psoriasis can be treated successfully with external remedies, *e. g.*, Chrysarobin, *B*-Naphthol, Anthrarobin (obtained from alizarin), Hydracetin (a coal-tar derivative), Hydroxylamin, Aristol, Europhen, Gallanol (anilide of gallic acid), Gallactophen (derived from carbolic acid, &c.), but a recurrence is not thereby prevented. Consequently we make use of internal remedies, *e. g.*, arsenic and potassium iodide, in the hope of so influencing the system that a permanent cure may result. Arsenic, about which opinions are so divergent, may be said to have failed as far as permanency of cure is concerned; as regards iodide of potassium similar opinions exist. Dr. Seifert, with the object of elucidating this point, gives us his experience in thirteen cases of psoriasis. Greves first suggested the administration of potassium iodide in large doses. Haslund treated a large number of cases, about fifty. Of these forty-six were cured temporarily, and four were much improved. He found that the average duration of treatment was seven weeks: the head and neck first recovered, then the trunk, and lastly the extremities; here the eruption persisted longest. As a rule no change occurred until some four weeks after continuous administration of potassium iodide, and then the integument rapidly showed signs of improvement. The amount given in males varied from 160 to 1,390 grms. (40 to 342½ drs.), in females from 526 to 1,328 grms. (156½ to 332 drs.), and in children from 277 to 1,520 grms. (69¼ to 380 drs.) It was given in plenty of water, and in one case Haslund gave 50 grms. (12½ drs.) in one day. In this case, however, signs of iodism supervened rapidly, headache, tinnitus aurium and palpitation. A noticeable feature in all cases was the acceleration of the pulse, but there was no other febrile symptom. Dr. Seifert quotes other dermatologists who have used the drug and come to opposite conclusions as to its efficacy. He believes, however, that its administration, combined with local treatment (chrysarobin), cures the disease more rapidly than either method alone employed.

Dr. Seifert divides his thirteen cases into three groups, on account of the action of the drug. All the cases, with one exception, were examples of psoriasis vulgaris; the exception showed palmar and plantar psoriasis as well as universal eruption. In two cases only the mother and the father suffered from the disease, in eleven it appeared after puberty. Seven were males and six females; all were healthy and well-nourished, with the exception, perhaps, of one female. Group I contained two cases, both females; they showed distinct evidences of iodism; and in one case, owing to gastric disturbance,

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the drug had to be stopped during the disappearance of the rash. The temperature was normal, but the pulse was as rapid as 128. Chrysarobin-traumaticin (chrysarobin, 1 dr.; liquoris gutta-percha, 1 oz.) was applied with benefit to the patches of psoriasis during the defervescence of the eruption. Group II contains seven cases, four were completely cured by potassium iodide without any external application. In the remaining three chrysarobin expedited the cure. Group III contains four cases completely healed under potassium iodide, and in each case the bodily weight was increased in spite of iodism.

Dr. Seifert then discusses the various symptoms produced by the drug. The presence of iodism with small doses ·32 grm. (5 grains) and its absence in large doses 1 grm. (15 grs.) and upwards, he refers to the diuretic action of the drug. In cases of albuminuria where its excretion is interfered with, potassium iodide should not be given. As regards the multiform character of the skin eruption, of which he gives *in extenso* examples, he concludes that the severer eruptions—pemphigus, purpura—are more frequent than the slighter ones—erythema, papules. He does not accept Wood's theory, that psoriatics tolerate large doses of iodide of potassium because psoriasis is a manifestation of attenuated inherited syphilis.

The writer does not recommend potassium iodide in all cases of psoriasis, or even to the exclusion of external remedies, but rather regards it as an adjuvant to our treatment of the disease, and of value in those cases where the general health is good, and the urine has been ascertained to be free from albumen.—(*British Journal of Dermatology*, April, 1895.)

The Removal of Tatoo-Marks and Nævi by Chloride of Zinc. M. J. Brault (Société de Dermatologie et de Syphiligraphie, Paris), *Annales de Dermatologie et de Syphiligraphie*, January, 1895.—This method of treatment consists, "after asepsis of the region, in making, or rather re-making, by means of needles, a tatooing with chloride of zinc." The best strength of solution for use is one of 30 parts of zinc chloride to 40 parts of sterilised water. If proper care be taken, the operation is not followed by any untoward inflammatory reaction. After a few days a superficial crust forms, which falls about the fifth to the tenth day, leaving in favourable cases, a superficial and supple scar, which in course of time becomes almost imperceptible. The application is simple and rapid, is accompanied by no pain, and gives immediate and remote results which are very encouraging.

The delicate point in the operation consists in adjusting the amount of therapeutic action to the depth and nature of the tatoo-marks.

With superficial pigmentary nævi the operation is very successful, but with vascular nævi the results have been so far less good, though the author has had less experience with these cases. The method is dangerous, unless carefully and scientifically carried out, *i. e.*, it may lead to suppuration and deep cicatrices.—(*British Journal of Dermatology*, April, 1895.)

"The Hair Turning from White to Black after Exposure to Severe Cold." By George W. Griffiths, M.D.—"On 5th January, 1895, we had a tremendous fire in Louisville. The night was very cold, and the streets were covered with snow and ice. The gentleman I shall present as the subject of these remarks is an engineer in the Louisville Fire Department, aged 65 years, who was on duty from eleven o'clock on the night of 5th January until two o'clock on the following day, except when he was taken away overcome by sheer exhaustion, and sent by my friend Dr. Marshall in a carriage to his home, where he remained two or three hours, and again returned to duty. Two or three sections of hose were leaking near his engine, and the spray was blown by a strong north wind until he was covered from head to foot with ice, which became so thick that it had to be cut or broken off from his clothing. This man was constantly at his engine, exposed to the north wind, which was carrying the spray of water from the broken hose. The top of his head was the warmest part of the body; his eyebrows and

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whiskers became wet, and were frozen stiff. He had a red skull-cap over his head, and his helmet on top of that; his head was not exposed at all, nor any hair, except the eyebrows and whiskers.

I saw him next day, when he had a very feeble pulse, and was much exhausted and worn out. He has not been in robust health for some time. The next afternoon after the exposure to the severe cold, as I have indicated, his hair turned black; and the wonder becomes greater when we consider that his hair was perfectly white before. He has been grey for eight years, and for the past three years perfectly white; before that he was blonde. Now his hair is black. I have known this gentleman for over forty years. The hair is oily, and does not seem to be dead at all. His head has been very carefully scrubbed several times, as I was inclined at first to think the change in colour was caused by cinders or other foreign matter; but such did not prove to be the case."—(*Journal of Cutaneous and Genito-Urinary Diseases*, September, 1895.)

DISEASES OF THE EAR.

By Dr. WALKER DOWNIE.

British Medical Association—Section of Otology.—The Section of Otology at the recent annual meeting of the British Medical Association, held in London, was presided over by Sir William Dalby, whose introductory address chiefly dealt with the progress of otology since the last meeting.

The appointed discussion on the first day was on "The Treatment of Nerve Deafness," and the several members who took part referred more or less in detail to the various forms of treatment now in vogue. Of the many who, a few years ago, were loud in the praise of pilocarpin, Mr. Field was perhaps the only one who stuck to his guns. He stated that he certainly had had good results from its use; and he believed that if the cases were properly selected the treatment would prove satisfactory. It was observed that some who formerly spoke favourably of pilocarpin in the treatment of nerve deafness, some of whom had reported cases illustrative of the efficacy of the drug as recommended by Politzer, made the astonishing declaration at this meeting that they had found it of no use! Apparently it is going out of fashion.

On the second day the proceedings were raised to a higher level by Professor Macewen, who opened a discussion on "Cerebral Complications in Relation to Middle Ear Disease" before a large assembly. In his opening paper he directed attention to three points—to some fallacies in localisation: to the necessity for early recognition of tubercular disease of the middle ear: to the importance of bacteriology in aural surgery. He urged the necessity of thoroughness in treatment. Where disease was found in the middle ear it should be thoroughly eradicated; and where cerebral complications were present, it was necessary to remove not only the infected part, but also the paths by which infection had travelled.

International Congress of Otology at Florence.—At the Fifth International Congress of Otology, which was held at Florence on the 26th September, many papers were read by British and foreign aurists. One of the features of the meeting was an exhibition of preparations illustrating the anatomy of the ear by Professor Politzer. Dr. Thomson of London read a paper on "Antiseptics and Intra-nasal Surgery," and Dr. Macnaughton Jones, one on "Turbinal hypertrophy." For the rest, the subjects chosen were of a hackneyed character.

Dr. Jones' conclusions in regard to the evil influences of nasal hypertrophies on hearing, though recognised by specialists, may be here quoted, as they are worthy of the attention of the profession generally. They are:—1. Turbinal

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hypertrophy must be regarded as a serious complication of deafness and the cognate aural affections: in those cases in which it precedes the aural symptoms, we may justly regard it as being their principal cause. 2. In all cases in which the hypertrophic change is discovered, active therapeutic measures ought to be put in practice to reduce it. 3. Deviation or distortion, or morbid growth of the septum, is rarely if ever the cause of deafness, and they become so only in cases in which they complicate the turbinal hypertrophy. 4. In all cases in which we find that the occlusion of a nostril is in part due to the deviation of the septum or to a growth, the deviation must be rectified. 5. Turbinotomy is indicated and ought to be reserved for those cases in which, whether in consequence of the bulk or of the nature of the growth, it is vain to expect improvement from any other treatment.

A Case of Spontaneous Dehiscence of the Wall of the Superior Semi-circular Canal. By John Dunn, M.D., Richmond.—The conditions described were discovered at the *post-mortem* examination of a negro. No pathological conditions were discovered in the brain or in the temporal bones, and the following abnormalities he thinks should be considered as spontaneous.

On the superior surface of the right temporal bone there was a large irregular dehiscence, showing several large air spaces at the petro-squamous junction. A bristle passed into the more external air space, went into the mastoid antrum, passed into the internal ear, from which it went into the attic, and thence into the middle ear.

Further in, there was a large transverse dehiscence resulting in the loss of the whole of the superior bony wall of the superior semi-circular canal, so that the ridge of bone marking the position of this canal was much reduced in size, and the outer layer of the dura mater served as the roof of the superior canal.

Among other osseous lesions described was a large gap in the bone covering the carotid artery, and a dehiscence over the position of the geniculate ganglion.

A similar condition existed in the left temporal bone.

Such a condition of matters, though possibly very rare, adds to the already numerous avenues by which pus originating in the middle ear may find its way into the cranial cavity.—(*Archives of Otology*, April, 1895.)

A Large Insect in the Human Ear.—Dr. Edward Armitage of the Hawaiian Islands reports the case of a Portuguese aged 34, who complained of an insect having become lodged in his ear. On inspection, without the aid of a speculum, nothing could be seen, but on using hot water with a syringe the wing-sheaths of an insect were brought into view; then by means of a pair of forceps a cockchafer was extracted. The insect was nine-twelfths of an inch long, and five-twelfths broad at the junction of the head and thorax. After removal of the insect, examination with the help of a speculum showed one of the legs fixed to the tympanic membrane, but the patient would permit of no further treatment.—(*Lancet*, 12th October, 1895.)

Post-Nasal Growths. By W. Snowball, M.D., Melbourne.—This paper, read before the Melbourne Medical Association, gives a very fair up-to-date description of these growths. The nature of these adenoid vegetations is dealt with; the symptoms, both local and remote, associated with their presence are considered along with the consequences following on their presence, and some reflex conditions which occasionally occur. The methods by which they are diagnosed and removed are described, and attention is drawn to the extraordinary improvement which follows their removal.—(*The Australian Medical Journal*, 15th April, 1894.)

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Books, Pamphlets, &c., Received.

Dental Materia Medica and Therapeutics, by Jas. Stocken. Fourth Edition; revised by Leslie M. Stocken and J. O. Butcher, L.D.S. Eng. London: H. K. Lewis. 1895. (4s.)

Elements of Practical Medicine, by Alfred H. Carter, M.D. Lond. Seventh Edition. London: H. K. Lewis. 1895. (10s.)

The Methodical Examination of the Eye, being Part I of a Guide to the Practice of Ophthalmology, for Students and Practitioners, by William Lang, F.R.C.S. London: Longmans, Green & Co. 1895. (3s. 6d.)

The Structure of Man, an Index to his Past History, by Dr. R. Wiedersheim; translated by H. and M. Bernard; edited by G. B. Howes, F.L.S. With 105 Figures in the Text. London: Macmillan & Co. 1895. (8s. net)

Outlines of Practical Physiology, being a Manual for the Physiological Laboratory, including Chemical and Experimental Physiology, with reference to Practical Medicine, by William Stirling, M.D., Sc.D. With 289 Illustrations. London: Griffin & Co. 1895.

The Urine in Health and Disease, together with its Chemical Examination, by T. Aubrey Husband, M.B. Plates. Third Edition. Edinburgh: E. & S. Livingstone. 1895. (1s.)

Edinburgh Medical School Calendar and Guide to Students, 1895-96. Sixteenth Year of Publication. Edinburgh: E. & S. Livingstone. 1895. (2s.)

Diet in Sickness and in Health, by Mrs. Ernest Hart; with an Introduction by Sir Henry Thompson, F.R.C.S. London: The Scientific Press, Limited. 1895. (3s. 6d.)

A Smaller Atlas of Illustrations of Clinical Surgery, consisting of 136 Plates with Descriptive Letterpress, by Jonathan Hutchinson, LL.D., F.R.S. London: West, Newman & Co. 1895.

The Diseases of Children's Teeth: their Prevention and Treatment, by R. Denisen Pedley, M.R.C.S., L.D.S. Eng., F.R.C.S. Ed. London: J. P. Segg & Co. 1895.

Materia Medica Tables, designed for the Use of Students, by A. Herbert Butcher, L.R.C.P. & S. Ed. Edinburgh: E. & S. Livingstone. (1s. 6d. net.)

On Appendicitis, and on Perforation of Gastric and Duodenal Ulcer, by Gilbert Barling, B.S. Lond. Birmingham: Cornish Bros. 1895.

An Atlas of the Fertilization and Karyokinesis of the Ovum, by Edmund B. Wilson, Ph.D., and Edward Leaming, M.D., F.R.P.S. New York: published for the Columbia University Press by Macmillan & Co. 1895. (17s. net).

Aids to the Analysis of Foods and Drugs, by T. H. Pearmain and C. G. Moor, M.A., F.C.S. London: Baillière, Tindall & Cox. 1895. (3s. 6d.)

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THE

GLASGOW MEDICAL JOURNAL.

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ORIGINAL ARTICLES.

EPONYMIC STRUCTURES IN HUMAN ANATOMY.

BY JAMES FINLAYSON, M.D.,

Physician to the Glasgow Western Infirmary and to the Royal Hospital for Sick Children; Honorary Librarian to the Faculty of Physicians and Surgeons, Glasgow, &c.

DURING last winter one of my "bibliographical demonstrations" in our Faculty library here was designed to illustrate eponymic structures in anatomy. I had often felt that the names of great men in our profession which had happened to be preserved in the nomenclature of anatomy furnished about the only instruction in the history of medicine which many of our students acquired. Every one knows at least the name of Herophilus in this way; and not a few know that he was of the Alexandrian school before the Christian era. How many know as much of his equally famous contemporary, Erasistratus? But the names attached to the structures they are studying are usually mere names: very often not even the vaguest idea of their date or nationality is associated with them. How many of our students, in speaking of the capsule of Glisson or the foramen of Winslow, know whether Glisson or Winslow was an Englishman?

In preparing my demonstration I had the aid of two of my clinical assistants—Dr. John Love and Dr. John W. Findlay—

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without whose help I could not possibly have attempted the work. We searched out all the eponymic structures we could find, and then we searched out the books or papers of the authors, where these are described by them, whenever this was possible. Cards were then written with the name of the author, his nationality and designation, and the date of his birth and death. These were laid on the volumes, which were arranged on long tables in rough chronological order, as precision is impossible in this respect. We began with the fragments of Herophilus collected by Marx, and went on to the works of living men. Marks were often inserted in the volumes where the structures were described or delineated. The volumes arranged in this way gave a vivid idea of the progress of anatomy; and the illustrations were, of course, of very special interest to those who had never seen them before.

So much labour had been expended on this demonstration that it seemed desirable to expend a little more in making the list even more complete, so that it might be published for the use of others, although, no doubt, the sight of the books and plates was really the specialty of the demonstration.

In printing this list, an alphabetical rather than a chronological order seemed to be more useful and practicable.

The dates given are those of the birth and death when these were ascertained. In the case of living authors, a dash (—) after the date of birth indicates that death had not occurred, or was not known to have occurred. In some cases, only the date of birth or of death was known; in others, the date of graduation was all that was available; in a few, the date of the paper concerned with the name of the structure was the only clue; or perhaps the date of a professorial appointment.

In some cases, the nationality as judged by birth is different from that acquired by residence or professorial duties—in a few cases this correction has been added when it was known.

Indications of the locality of some of the less known structures have been added in brackets to aid the memory of the reader, or to guide him; but no attempt, of course, at precise definition is made in such a list.

The structures included in the list are those only which pertain to human anatomy. Purely microscopic terms, and those found only in comparative anatomy and embryology, and many terms in anthropology, have been omitted; but the line of demarcation cannot be drawn absolutely, and the general interest or currency of the term has determined the inclusion of some names near the border line.

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The data here given, however bald they may seem, are not always readily obtained; very possibly errors of various kinds may be detected by those whose reading and studies bear more on such subjects than mine; Mr. Henry E. Clark has already given me some help in this direction. Very many sources of information had to be searched, but the following are amongst the most important:—The *New Sydenham Society's Lexicon*, Wernich's *Biographisches Lexikon*, and the *Surgeon-General's Index-Catalogue of the Medical Library at Washington.*

The propriety of naming structures after men need not be discussed here. The actual fact is that they are so named; and the chronological arrangement showed very plainly how much this had increased within the last 100 years. This table may help to lessen what is apt to be a grave inconvenience.

Abernethy, John, ENGLISH SURGEON AND ANATOMIST, 1764—1831. —*Abernethy's fascia* (over external iliac artery).

Alcock, Thomas, ENGLISH SURGEON, 1784—1833.—*Canal of* (for internal pudic artery).

Andersch, C. S., GERMAN ANATOMIST, close of eighteenth century. —*Ganglion of* (petrous of glosso-pharyngeal).

Arantius (or **Aranzi**), **Julius Cæsar,** ITALIAN ANATOMIST, 1530—1589.—*Corpora Arantii; Duct of* and *Canal of* (ductus venosus); *Ventricle of* (end of calamus scriptorius).

Arnold, F., GERMAN ANATOMIST, born 1803.—*Ganglion of* (otic); *Nerve of* (auricular branch of vagus); *Suspensory ligament of* (incus); *Convolution of* (posterior inferior, occipito-temporal lobe); *Membrane of* (pigmented layer of iris).

Auerbach, Leopold, GERMAN ANATOMIST, 1824—.—*Ganglion of; Plexus of* (in small intestine).

Baillarger, J., FRENCH PHYSICIAN, 1815—.—*Lines of* (in brain).

Barkow, Hans Karl Leopold, PROFESSOR OF ANATOMY IN BRESLAU, 1798—1873.—*Ligament of* (in olecranon fossa).

Bartholin, Thomas, DANISH PHYSICIAN, 1616 or 1619—1680.—*Glands of Bartholin; Duct of Bartholin* (sublingual).

Baudelocque, Jean Louis, FRENCH ACCOUCHEUR, 1745—1810.—*Line of* (external conjugate diameter of pelvis).

Bauhin, Caspar, FRENCH ANATOMIST, 1560—1624.—*Valve of; Glands of* (tongue).

von Bechterew, W., RUSSIAN NEUROLOGIST, living.—*Nucleus of* (near Deiters', in medulla).

Bell, Sir Charles, SURGEON AND PHYSIOLOGIST IN LONDON (Scottish birth), 1774—1842.—*External respiratory nerve of; Muscle of* (trigone of bladder).

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Bellini, L., ANATOMIST OF FLORENCE, 1643—1704.—*Ligament of* (hip-joint); *Ducts of* (kidneys).

Bernard, Claude, FRENCH PHYSIOLOGIST, 1813—1878.—*Canal of* (supplementary duct of pancreas).

Bertin, E. J., FRENCH ANATOMIST, 1712—1781.—*Ligament of* (ilio-femoral); *Bones of* (in sphenoid); *Septa* or *Columns of* (between pyramids of kidney).

Bichat, M. F. Xavier, PROFESSOR OF ANATOMY AND PHYSIOLOGY IN PARIS, 1771—1802.—*Fissure of* (cerebellum); *Foramen of* (third ventricle).

Bidder, Heinrich F., GERMAN ANATOMIST, 1810—(papers published in 1866 and 1868).—*Ganglion of* (auriculo-ventricular septum).

Bigelow, John Milton, AMERICAN SURGEON, 1846—.—*Ligament of* (ilio-femoral or Y-shaped).

Blandin, Philippe Frédéric, FRENCH SURGEON, 1798—1849.—*Glands of* (tongue).

Blumenbach, Johann Friedrich, GERMAN ANATOMIST, 1752—1840.—*Clivus* or *plane of* (in sphenoid).

Bochdalek (Father), **Victor Alexander,** PROFESSOR OF ANATOMY IN PRAGUE up till 1869. **Bochdalek** (Son), **Victor,** ANATOMIST IN PRAGUE (papers published from 1866).—*Ganglion of* (above upper canine tooth).

Bock, Au. C., GERMAN ANATOMIST (book on ganglionic system published in 1817 to 1821).—*Nerve of* (pharyngeal); *Ganglion of* (cavernous).

Boerhaave, Hermann, DUTCH PHYSICIAN, 1668—1738.—*Glands of* (sudoriparous).

Botalli, Leonard, ITALIAN ANATOMIST, born 1530; lived in France from 1561 till 1585.—*Foramen of Botalli* (foramen ovale); *Ligament of* (obliterated ductus arteriosus).

Bowman, Sir William, ENGLISH ANATOMIST AND PHYSIOLOGIST, AND OPHTHALMIC SURGEON, 1816—1892.—*Glands of* (in olfactory mucous membrane); *Bowman's capsule* (in kidney); *Bowman's discs* (muscles); *Bowman's lamellæ* (of cornea); *Muscle of* (fibres in ciliary muscle).

Breschet, Gilbert, FRENCH ANATOMIST, 1784—1845.—*Canals of,* (in diploë, for) *Breschet's veins; Sinus of* (spheno-parietal).

Broca, P., FRENCH SURGEON AND ANTHROPOLOGIST, 1824—1880.—*Convolution of.*

Brodie, Sir Benjamin, ENGLISH SURGEON, 1783—1862.—*Bursa of* (knee).

Bruch, Max. Julius Friedrich (thesis published in Berlin in 1835). *Glands of* (in conjunctiva, synonymous with trachoma glands of Henle); *Muscle of* (ciliary); *Membrane of* (choroid).

Brücke, Ernst, GERMAN PHYSIOLOGIST, 1819—.—*Muscles of* (ciliary muscle).

Bryant, Thomas, ENGLISH SURGEON, licensed 1849 (living).—*Triangle of* (ilio-femoral at hip).

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Brunner, Johann Conrad, SWISS ANATOMIST, 1653—1727.—*Brunner's glands.*

Burdach, K. F., GERMAN ANATOMIST, 1776—1847.—*Columns of Burdach.*

Burow (Father), **August,** GERMAN SURGEON, 1809—1874. **Burow** (Son), **Ernst,** GERMAN SURGEON, 1838—1885.—*Veins of* (connecting portal and general circulation).

Burns, Allan, GLASGOW ANATOMIST, 1781—1813.—*Ligament of* (at saphenous opening); *Space of* (in neck).

Camper, Pierre, DUTCH PHYSIOLOGIST, 1722—1789.—*Facial angle of; Ligament of* (in urethra); *Fascia of; Inter-columnar bands.*

Carcassonne, Bernard Gauderic, FRENCH SURGEON, born 1728.—*Ligament of* (deep perineal fascia).

Casserio, Giulio, ITALIAN ANATOMIST, 1545—1616.—*Perforated muscle of Casserius* (coraco-brachialis); *Artery of* (internal carotid and middle meningeal); *Nervus perforans Casserii* (musculo-cutaneous).

Chassaignac, C. M. E., FRENCH SURGEON AND ANATOMIST, 1805—1879.—*Chassaignac's tubercle* (anterior tubercle of transverse process of sixth cervical vertebra).

Chaussier, François, FRENCH SURGEON AND ANATOMIST, 1746—1828.—*Line of* (raphe of corpus callosum).

Chopart, François, FRENCH SURGEON, 1743—1795.—*Line of* (in foot).

Clarke, Joseph Lockhart, ENGLISH MICROSCOPIST, 1817—1880.—*Clarke's columns.*

Claudius, Friedrich Matthias, PROFESSOR OF ANATOMY AT MARBURG, 1822—1869.—*Cells of* (cochlea).

Clevenger, Shobal, AMERICAN NEUROLOGIST, 1843—.—*Inferior occipital fissure of* (in brain).

Cloquet, Hippolyte, PARISIAN SURGEON, 1787—1840.—*Ganglion of* (naso-palatine); *Angle of* (facial); *Septum of* (septum crurale internum).

Colles, Abraham, IRISH SURGEON, 1773—1843.—*Ligament of* (ligamentum triangulare femoris); *Fascia of* (deep layer of superficial perineal).

Cooper, Sir Astley Paston, ENGLISH SURGEON, 1768—1841.—*Oblique band of* (elbow-joint); *Ligament of* (in mamma); *Reflected tendon of* (transversalis); *Fascia propria of* (internal abdominal ring).

Corti, Marquis Alfonso, ITALIAN ANATOMIST (paper published in 1851).—*Arches of; Cells of; Fibres or rods of; Ganglion of; Membrane of; Organ of; Tunnel of* (cochlea).

Cotunnius (Cotugno), Domenico, ITALIAN ANATOMIST, 1736—1818.—*Aqueduct of* (aqueductus vestibuli); *Liquor of* (perilymph); *Nerve of* (naso-palatine); *Recessus Cotunnii* (in petrous bone).

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Cowper, William, ENGLISH ANATOMIST AND SURGEON, 1666—1709. —*Cowper's glands; Ligament of* (pubic).

Cruveilhier, Jean, FRENCH SURGEON AND PATHOLOGIST, 1791—1874.—*Plexus of* (in cervical region); *Fascia of* (superficial perineal).

Cuvier, Georges, L. C. D., FRENCH NATURALIST, 1769—1832.—*Canal of* (ductus venosus).

von Cyon, Elie, RUSSIAN PHYSIOLOGIST, born at Telsh, 1843—. —*Nerve of* (depressor).

Dalton, John Call, jun., AMERICAN PHYSIOLOGIST, 1825—.—*Parietal fissure of* (in brain).

Deiters, Otto Friedrich Karl, GERMAN ANATOMIST AND HISTOLOGIST, 1834—1863.—*Deiters' nucleus* (in direct sensory cerebellar tract); *Deiters' cells* (inner ear).

Demours, Pierre, FRENCH OPHTHALMOLOGIST, 1702—1795.—*Membrane of* (Descemet's).

Descemet, Jean, FRENCH PHYSICIAN, 1732—1810.—*Membrane of* (cornea).

Douglas, James. OBSTETRICIAN AND ANATOMIST IN LONDON (Scottish birth), 1675—1741.—*Douglas' pouch; Douglas' semilunar fold* or *ligament*.

Duverney, Joseph Guischard, FRENCH PHYSICIAN, 1648—1730. —*Duverney's gland* (gland of Bartholin); *Foramen of* (foramen of Winslow).

von Ebner, Victor, GERMAN ANATOMIST (paper published in 1873). *Gland of* (in tongue).

Ecker, Alexander, GERMAN ANATOMIST, PROFESSOR OF COMPARATIVE ANATOMY IN FREIBURG, 1816—1887.—*Occipital and transverse fissures of* (in brain).

Ehrenritter, .—*Ganglion of* (jugular of glosso-pharyngeal).

Ellis, George Viner, PROFESSOR OF ANATOMY, UNIVERSITY COLLEGE, LONDON; elected a Fellow of Royal College of Surgeons in 1843 (living).—*Ligament of* (in rectum).

Eustachius, B., ITALIAN ANATOMIST, died 1574.—*Eustachian cartilage, canal*, or *tube; Eustachian valve* (in heart).

Fallopius, G., ITALIAN ANATOMIST, 1523—1562.—*Fallopian tube, artery*, and *isthmus; Aqueduct, arch*, and *canal of; Hiatus of; Muscle of* (pyramidalis nasi).

Ferrein, A., FRENCH PHYSICIAN, 1693—1769.—*Canal of; Pyramids of; Tubes of; Foramen anonymum Ferreini* (hiatus Fallopii).

Flechsig, R. Ferdinand, GERMAN, born 1817.—*Columns of* (spinal cord).

Flood, Valentine, IRISH SURGEON, died 1847.—*Ligament of* (glenohumeral).

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Folius, Cæcilius, ITALIAN ANATOMIST, 1615—1660.—*Muscle of* (laxator tympani); *Processus Folianus* (processus gracilis of malleus).

Foltz, J. C. E., FRENCH OPHTHALMIC SURGEON, 1822—1876.—*Valve of* (at canaliculus lachrymalis).

Fontana, Felix, ITALIAN ANATOMIST, 1730—1805.—*Spaces of* and *canal of* (at iris).

Foville, A. L., FRENCH PHYSIOLOGIST, 1799—1878.—*Oblique fasciculus of* (peduncle of cerebellum); *Decussation of* (in cerebellum).

Frankenhäuser, F., GERMAN (memoir published in 1867).—*Ganglion of* (cervico-uterine).

Gærtner, Karl F., GERMAN ANATOMIST, 1786—1833.—*Duct of* or *canal of* (relic of Wolffian duct).

Galeati (or **Galeazzi**), **Dom. Max. Gusman,** ITALIAN ANATOMIST, 1686—1775.—*Glands of* (Lieberkühn's).

Galen of Pergamum, PHYSICIAN TO EMPEROR MARCUS AURELIUS, 130—200 A.D.—*Venæ Galeni* (in brain); *Vein of* (anterior cardiac vein); *Galen's anastomosis* (between superior and inferior laryngeal nerves); *Foramen of* (foramen ovale).

Gasserius, Johann Laurentius, *Gasserian ganglion* (named in his honour by his pupil, Hirsch, in 1765); *Muscle of* (ligamentum mallei externum or laxator tympani minor).

Gavard, Hyacinthe, FRENCH ANATOMIST, 1753—1802.—*Muscle of* (oblique fibres in stomach).

Gennari, Francisco, ITALIAN ANATOMIST (book published, 1782).—*Lines of* (Baillarger's).

Gerdy, Pierre Nicolas, FRENCH ANATOMIST, 1797—1856.—*Ligament of* (in axilla).

de Gimbernat, Don Antonio, SPANISH SURGEON; PROFESSOR AT BARCELONA FROM 1762—1774.—*Gimbernat's ligament.*

Giraldès, Joachim Albin, ANATOMIST AND SURGEON IN PARIS, born in Portugal, 1808—1875.—*Organ of* (epididymis).

Glaser, Johann Heinrich, SWISS ANATOMIST, 1629—1675.—*Glaserian fissure* (petrous bone); *Glaserian artery* (tympanum).

Glisson, F., ENGLISH PHYSICIAN AND PROFESSOR OF MEDICINE IN UNIVERSITY OF CAMBRIDGE, 1596—1677.—*Capsule of.*

Godman, John D., AMERICAN ANATOMIST, 1794—1830.—*Fascia of* (root of neck and joining pericardium).

Goll, Friedrich, SWISS ANATOMIST, born at Zürich, 1829.—*Column or tract of.*

Gowers, Wm. Richard, ENGLISH NEUROLOGIST, graduated in medicine, 1869 (living).—*Gowers' columns* (antero-lateral, ascending).

de Graaf, Regnier, DUTCH ANATOMIST, 1641—1673.—*Graafian follicles or vesicles.*

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Gratiolet, Louis Pierre, FRENCH ANATOMIST, 1815—1850.—*Gratiolet's bundle* (occipital lobe and optic radiation).

Gudden, Bernhardus, GERMAN NEUROLOGIST, 1824—.—Thesis, 1848.—*Commissure of* (optic tract).

Guthrie, George James, ENGLISH MILITARY SURGEON, 1785—1856.—*Muscle of* (compressor urethræ).

Haller, Albertus, SWISS ANATOMIST AND PHYSIOLOGIST, 1708—1777.—*Ligamentum colicum Halleri* (a fold extending along ascending colon); *Linea splendens of* (in spinal pia); *Circulus venosus of* (around nipple).

Hannover, A., GERMAN OPHTHALMOLOGIST, 1814—.—*Canal of* (Petit's).

Harder, Johann Jacob, SWISS ANATOMIST, 1656—1711.—*Gland of* (obsolete in man).

von Hasner, Joseph Robert, GERMAN OPHTHALMIC SURGEON, born 1819 (tract published, 1850).—*Valve of* (nasal duct).

Hassall, Arthur Hill, ENGLISH PHYSICIAN AND CHEMIST, 1817—1894.—*Concentric corpuscles of* (thymus).

Havers, Clopton, ENGLISH ANATOMIST, end of seventeenth and beginning of eighteenth century.—*Haversian canals* and *lamellæ; Haversian fringes and glands.*

Heister, Lorenz, GERMAN ANATOMIST, 1683—1758.—*Valve of* (gall-bladder).

von Helmholtz, Hermann Ludwig Ferdinand, PROFESSOR OF PHYSICS IN BERLIN, 1821—1894.—*Ligament of* (malleus).

Helvetius, J. C. A. —*Ligament of* (lateral bands in stomach).

Henle, Fried. Gustav Jacob, GERMAN ANATOMIST AND PATHOLOGIST, 1809—1885.—*Looped tubes of; Fenestrated membrane of* (beneath endothelium of arteries).

Hensen, Victor, GERMAN EMBRYOLOGIST, 1835—.—*Canal of* (ear).

Herophilus (fragments collected by Marx) ALEXANDRIAN SURGEON AND ANATOMIST ABOUT B.C. 300.—*Torcular Herophili* (ληνός).

Hesselbach, F. K., GERMAN SURGEON, 1759—1816.—*Triangle of* (lower part of abdomen).

Hey, William, SURGEON IN LEEDS, 1736—1819.—*Ligament of* (fascia lata).

Highmore, Nathaniel, ENGLISH PHYSICIAN, 1613—1684.—*Antrum of* (in jaw); *Corpus Highmorianum* (in testicle).

Hilton, John, ENGLISH SURGEON, 1804—1878.—*Muscle of* (aryteno-epiglottideus inferior); *Line of* (at anus).

Hirschfeld, Ludwig Moritz, GERMAN NEUROLOGIST, 1816—.—*Ganglion of* (hippocampal gyrus).

His, Wilhelm, GERMAN ANATOMIST, .—*Space of* (for lymphatics).

Holden, Luther, ENGLISH SURGEON, licensed 1838 (living).—*Line of* (Poupart's ligament).

Home, Sir Everard, ENGLISH SURGEON, 1763—1832.—*Lobe of* (prostate).

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Horner, William Edmonds, AMERICAN SURGEON, 1793—1853.—*Muscle of* (tensor tarsi).

Houston, John, IRISH SURGEON, 1802—1845.—*Folds of* (in rectum); *Muscle of* (compressing veins of penis); *Valves of* (in rectum).

Hovius, Jacobus, DUTCH ANATOMIST, M.D. in 1702.—*Plexus of* (in ciliary region); *Canal of* (same as Fontana); *Sinus venosus Hovii* (venæ vorticosæ).

Huguier, Pierre Charles, FRENCH SURGEON, 1804—1873.—*Glands of* (two small glands opening into vagina); *Canal of* (for chorda tympani).

Hunter, John, PHYSIOLOGIST, PATHOLOGIST, AND SURGEON IN LONDON (Scottish birth), 1728—1793.—*Hunter's canal.*

Hunter, William, ANATOMIST, PHYSICIAN, AND OBSTETRICIAN IN LONDON (Scottish birth), 1718—1783.—*Ligament of* (round ligament of uterus).

Huschké, Emil, GERMAN ANATOMIST, 1797—1858.—*Huschké's valve* (lachrymal); *Huschké's canal* (tympanum); *Huschké's foramen* (tympanic plate).

Ingrassias, Giovanni Filippo, ANATOMIST IN NAPLES, 1510—1580.—*Processes of* (lesser wings of sphenoid).

Jacob, Arthur, IRISH OPHTHALMIC SURGEON, 1790—1874.—*Jacob's membrane or coat* (in retina).

Jacobson, Ludwig Levin, DANISH ANATOMIST, 1783—1843.—*Jacobson's anastomosis; Canal of; Cartilage of; Jacobson's nerve; Jacobson's organ.*

Jarjavay, J. F., FRENCH SURGEON, 1815—1868.—*Muscle of* (depressor urethræ).

Kerkring, Theodorus, DUTCH ANATOMIST, 1640—1693.—*Valves of* (valvulæ conniventes).

Kilian, Hermann Friedrich, GERMAN PROFESSOR OF MIDWIFERY, 1800—1863.—*Linea prominens of* (sacrum).

Kobelt, Georg Ludwig, GERMAN SURGEON, 1804—1857.—*Muscle of* (compressor of venæ dorsales penis).

Kölliker, Rudolph Albert, SWISS ANATOMIST AND PROFESSOR IN WÜRZBURG, 1817—.—*Nucleus of* (central canal of spinal cord).

Krause, Wilhelm, GERMAN ANATOMIST, 1833—.—*Glands of* (conjunctiva); *Membrane of* (microscopic muscular structure).

Labbé, Charles (thesis published in Paris, 1882).—*Posterior anastomosing vein of Labbé* (a cortical cerebral vein).

Lancisius, J. M., ITALIAN PROFESSOR OF ANATOMY, 1654—1720.—*Nerves of Lancisi* (in corpus callosum).

Laumonier, Jean Baptiste, FRENCH SURGEON, 1749—1818.—*Ganglion of* (carotid superior).

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Laura, Secondo, ITALIAN PHYSICIAN, 1833—.—*Nucleus of* (external auditory).

Lauth, Thomas, GERMAN ANATOMIST, 1758—1826.—*Transverse ligament of* (atlas).

Leber, Theodore, GERMAN OPHTHALMOLOGIST, 1840—.—*Venous plexus of* (in eyeball).

Lesser, Adolph, PHYSICIAN IN BERLIN, born 1851.—*Triangle of* (in neck).

Lieberkühn, Johann Nath., GERMAN PHYSICIAN AND NATURALIST, 1711—1756.—*Lieberkühn's ampulla; Lieberkühn's crypts or glands.*

Lieutaud, Joseph, FRENCH ANATOMIST, 1703—1780.—*Uvula of* (in trigone of bladder).

Lisfranc, Jacques, FRENCH SURGEON, born 1847.—*Lisfranc's tubercle* (on first rib).

Littré, Alexis, FRENCH SURGEON, 1658—1726.—*Glands of* (in urethra).

Lizars, John, EDINBURGH SURGEON, 1783—1860.—*Lines of* (gluteal region).

Lockwood, C. B., ENGLISH SURGEON, M.R.C.S. in 1878 (living).—*Ligament of* (tendo orbitalis superior).

Loewenberg, Benjamin, GERMAN AURAL SURGEON IN PARIS, 1836—.—*Canal of* (in cochlea).

Loewit, M., PHYSIOLOGIST AND PATHOLOGIST IN PRAG (papers published, 1880-81).—*Ganglion of* (bulbus arteriosus).

Louis, P. C. A., FRENCH PHYSICIAN, 1787—1872.—*Angulus Ludovici*, or *Louis'* or *Ludwig's angle* (sternum).

Lower, Richard, ENGLISH PHYSICIAN, 1631—1691.—*Tubercle of* (in right auricle).

Ludwig, Karl Friedrich Wilhelm, PROFESSOR OF PHYSIOLOGY IN LEIPZIG, 1816—1895.—*Ganglion of* (right auricle of heart).

Ludwig's *angle* (see Louis).

von Luschka, Hubert, GERMAN ANATOMIST, 1820—1875.—*Gland of* (coccygeal); *Cartilage of* (larynx); *Tonsil of; Muscle of* (in utero-sacral ligament).

Luys, Jules, FRENCH PHYSICIAN, 1826—.—*Body of* (between crusta and tegmentum).

Macdowel, Benj. Geo., IRISH SURGEON, 1820—1885.—*Frenum suspensorium of* (shoulder, pectoralis).

Magendie, François, FRENCH SURGEON AND PHYSIOLOGIST, 1783—1855.—*Foramen of* (in fourth ventricle).

Malpighi, M., ITALIAN ANATOMIST, 1628—1694.—*Acini, Bodies, Canals, Capsule, Corpuscles, Follicles of; Glomeruli, Pyramids, Tubules, Tufts of; Malpighian layer* (in skin).

Marshall, John, ENGLISH SURGEON, 1818—1891.—*Oblique vein of* (vein crossing dorsal portion of left auricle); *Vestigial fold of* (pericardium).

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Mauchart, Burchard David, PROFESSOR OF ANATOMY IN TÜBINGEN, 1696—1751.—*Ligament of* (odontoid).

Mayer, August Franz, GERMAN ANATOMIST, 1787—1865.—*Ligament of* (carpus).

Meckel, Johann Friedrich, GERMAN ANATOMIST, 1714—1774.—*Meckel's ganglion; Meckel's diverticulum; Meckel's space; Cartilage of* (mandible, embryonic),

Meibomius, H., GERMAN PHYSICIAN, 1638—1700.—*Meibomian follicles and glands; Foramen of* (cæcum of tongue).

Meissner, Georg, GERMAN PHYSICIAN, 1829—.—*Plexus of* (in intestinal submucosa).

Mendel, Emanuel, GERMAN NEUROLOGIST, 1839—.—*Convolution of* (opercular).

Mercier, L. A., FRENCH SURGEON, 1811—1882.—*Mercier's bar* (in front of post-trigonal pouch).

Merkel, Karl L., GERMAN ANATOMIST, 1812—1876.—*Ganglia and corpuscles of* (touch); *Muscle of* (kerato-cricoid).

Mery, Jean, FRENCH SURGEON, 1645—1722.—*Glands of* (Cowper's).

Meynert, T., PROFESSOR OF ANATOMY IN VIENNA, 1833—.—*Ganglion of* (optic basal).

Mierzejewsky, M., FRENCH PHYSICIAN (present time).—*Foramen of* (under ligula).

Mohrenheimer, .—*Space of* (between pectoralis major and deltoid).

Moll, Jacob Antonius, DUTCH HISTOLOGIST (thesis in 1857).—*Glands of* (at margin of eyelid).

Monro, Alexander (Monro secundus), PROFESSOR OF ANATOMY IN EDINBURGH UNIVERSITY, 1733—1817.—*Foramen of* (said to have been previously described by Vieussens); *Sulcus of* (in third ventricle of brain).

Morgagni, J. Baptiste, ITALIAN PHYSICIAN AND PATHOLOGIST, 1682—1771.—*Caruncula Morgagni* (middle lobe of prostate); *Frænum Morgagni* (projection formed by the ileo-colic and ileo-cæcal valve); *Glands of* (urethral); *Fossa of* (navicular); *Hydatids of* (testicle; fimbriæ of Fallopian tube); *Foramen cæcum Morgagni* (in tongue); *Columns of* (in rectum).

Müller, Heinrich, GERMAN ANATOMIST, 1820—1864.—*Muscles of* (in spheno-maxillary fossa, in eyelid, and circular fibres of ciliary muscle).

Müller, Johann, GERMAN ANATOMIST AND PHYSIOLOGIST, 1801—1858.—*Ganglion of* (jugular and prostatic); *Duct of* (fœtal); *Fibres of* (in retina).

Naboth, Martin, SAXON PHYSICIAN, 1675—1721.—*Glands of* (neck of uterus); *Ovules of*; *Vesicles of* (same as glands).

Nasmyth, Alexander, DENTAL SURGEON IN LONDON (paper published, 1839), died 1849.—*Nasmyth's membrane* (cuticle of enamel).

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Nélaton, Auguste, FRENCH SURGEON, 1807—1873.—*Test line of* (anterior superior spine of ilium to tuberosity of ischium); *Fibres of* (circular fibres of rectum).

Neubauer, Johann Ernst, GERMAN ANATOMIST, 1742—1777.—*Artery of* (occasional branch of inferior thyroid).

Nuck, Antoine, PROFESSOR OF ANATOMY AND SURGERY AT LEYDEN, 1650—1692.—*Canal of; Glands of.*

Nuhn, Anton, PROFESSOR OF ANATOMY IN HEIDELBERG, born 1814.—*Glands of* (near apex of tongue).

Pacini, Filippo, ITALIAN PHYSIOLOGIST AND PHYSICIAN, 1812—1883.—*Corpuscles of* (touch).

Pacchionius, Antoninus, ROMAN PHYSICIAN, 1665—1726.—*Pacchionian bodies; Pacchionian fossæ or depressions.*

Pansch, Adolf, in 1865 PROSECTOR OF ANATOMY AT KIEL UNIVERSITY, 1841—1887.—*Parietal fissure of* (in brain).

Pechlin, Johannes Nicolaas, GERMAN , 1644—1706.—*Glands of* (Peyer's).

du Petit, François Pourfour, FRENCH SURGEON AND ANATOMIST, 1718—1794.—*Canal of* (in ligament of lens).

Petit, J. L., FRENCH SURGEON, 1674—1750.—*Triangle of* (abdomen); *Sinus of* (Valsalva).

Peyer, Johann K., SWISS ANATOMIST, 1653—1712.—*Peyer's glands and patches.*

Poupart, François, FRENCH ANATOMIST, 1616—1708.—*Poupart's ligament* (also called ligament of Vesalius).

Rathke, Martin, GERMAN ANATOMIST, 1793—1860.—*Gland of* (nasal).

Rauber, August, GERMAN ANATOMIST, 1845—.—*Convolution of* (nuclear, in olivary body).

Reichert, Karl B., GERMAN ANATOMIST, 1811—1883.—*Membrane of* (Bowman's).

Reil, Johann Christian, GERMAN PHYSICIAN, 1759—1813.—*Island of; Fissure of; Band of* (heart).

Reissner, Ernst, RUSSIAN ANATOMIST, 1824—1878.—*Reissner's canal* (cochlea); *Reissner's membrane.*

Remak, Robert, GERMAN PHYSICIAN, 1815—1865.—*Ganglion of* (in heart).

Retzius, Andreas A., SWEDISH ANATOMIST, born 1795.—*Ligament of* (annular ligament of leg).

Ribes, François, PROFESSOR OF HYGIENE AT MONTPELLIER, 1800—1864.—*Ganglion of* (upper end sympathetic).

Richet, C., FRENCH PHYSIOLOGIST, .—*Fascia and canal of* (for umbilical vein).

Ridley, H., ENGLISH ANATOMIST, 1653—1708.—*Sinus circulaire de Ridley* (brain).

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Riolanus, Jean, FRENCH ANATOMIST, 1580—1657.—*Muscle of* (in eyelid); *Bones of* (in petro-occipital suture).

Rivini, Augustus Quirinus, GERMAN PROFESSOR OF PHYSIOLOGY, 1632—1723.—*Duct of* (one of sublingual ducts); *Notch of* (in tympanic ring); *Foramen of* (in tympanum, disputed); *Gland of* (sublingual).

Robin, C. P., FRENCH PHYSIOLOGIST, 1821—1885.—*Space of* (in adventitia of arteries).

Rolando, Louis, PROFESSOR OF ANATOMY IN TURIN, 1773—1831.—*Fissure of; Columns of* (medulla); *Tubercles of* (medulla oblongata).

Rosenmüller, Johann Christian, in 1820 he was appointed PROFESSOR OF ANATOMY AND SURGERY IN UNIVERSITY OF LEIPSIC (drawings in works are by himself), 1771—1820.—*Fossa of; Organ or body of; Rosenmüller's gland.*

Ruyschius, Fred., PROFESSOR OF ANATOMY AT AMSTERDAM, 1638—1731.—*Membrana Ruyschiana* (choroid).

Santorini, Giovanni Domenico, ITALIAN ANATOMIST, 1681—1737.—*Canal of; Cartilages and ligament and tubercle of; Duct of; Fissure of; Muscle of* (risorius); *Incisura Santorini* (external auditory meatus).

Scarpa, Antoine, ITALIAN SURGEON, 1752—1832.—*Scarpa's triangle; Scarpa's fascia; Nerve of* (naso-palatine); *Scarpa's liquor* (the endolymph); *Ganglion of* (near internal auditory meatus); *Foramina of* (incisor canal); *Canals of* (superior maxilla); *Sinus ellipticus Scarpæ* (ampulla).

Schacher, P. G., GERMAN PHYSICIAN, 1674—1737.—*Ganglion of* (ophthalmic).

Schachowa, Seraphina (thesis on kidneys published in Bern, 1876).—*Spiral tubules of* (kidney).

Schlemm, F., GERMAN ANATOMIST, 1795—1858.—*Canal of* (sclera); *Ligament of* (shoulder).

Schmiedel, .—*Ganglion of* (carotid inferior).

Schneider, Conrad Victor, PROFESSOR OF MEDICINE, WITTEMBERG, 1614—1680.—*Schneiderian Membrane.*

Schrapnell (see Shrapnell).

Schwalbe, Gustavus A., GERMAN ANATOMIST, 1844—.—*Convolution of* (parieto-occipital).

Serres, A. E. R. A., FRENCH ANATOMIST, 1786—1868.—*Dental glands of* (emerging teeth).

Shrapnell, H. J., ENGLISH ANATOMIST (paper published 1832).—*Membrane of* (membrana flaccida).

Simon, Sir John, ENGLISH SURGEON (licensed 1838, living).—*Femoral and brachial triangle of.*

Skene, A. J. C., AMERICAN GYNÆCOLOGIST, 1837—.—*Skene's tubules* (representative in female of vesiculæ seminales).

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Soemmering, Saml. T., GERMAN ANATOMIST, 1755—1830.—*Soemmering's bone* (part of malar); *Soemmering's foramen* (retina); *Soemmering's ganglion* (thalamus); *Soemmering's nerve* (long pudic); *Soemmering's numbering of cranial nerves.*

van den Spiegel, A., PROFESSOR OF ANATOMY AND SURGERY AT UNIVERSITY OF PADUA, born at Brussels, 1578.—*Line of Spiegelius* (linea semilunaris); *Spiegelian lobe of the liver.*

Stensen, Niels, DANISH ANATOMIST, 1638—1686.—*Stensen's or Steno's canal, duct, and foramen.*

Stilling, Benedict, GERMAN ANATOMIST AND SURGEON, 1810—1879.—*Nucleus of* (nervus tegmenti); *Canal of* (centre of vitreous).

Swan, Joseph, ENGLISH ANATOMIST, 1791—1874.—*Foramina of* (for superior dental nerves).

Sylvius, Jacobus (Jacques Dubois), PROFESSOR OF ANATOMY IN PARIS, 1478—1555.—*Sylvian artery, fissure, and fossa; Aqueduct of.*

Tarinus, P., FRENCH ANATOMIST, died 1761.—*Foramen of* (hiatus Fallopii); *Pons Tarini* (posterior perforated space).

Tenon, J. R., FRENCH SURGEON, 1724—1816.—*Capsule of; Space of.*

Thebesius, Adam Christian, GERMAN PHYSICIAN, 1686—1732.—*Foramen of* (in heart); *Veins of* (in heart).

Trolard, Paulin, Thesis in Paris, 1868.—*Vein of* (emptying into superior petrosal sinus).

Tulpius, Nicolas, DUTCH ANATOMIST, 1593—1674.—*Valve of Tulpius* (ileo-cæcal valve).

Türck, Ludwig, GERMAN PHYSICIAN, 1810—1868.—*Türck's columns.*

Turner, Sir William, PROFESSOR OF ANATOMY IN EDINBURGH (English birth), 1832—.—*Annectant convolution of.*

Tyrrell, Frederick, ENGLISH SURGEON, 1797—1843.—*Fascia of* (recto-vesical layer).

Tyson, James T., AMERICAN PROFESSOR OF PATHOLOGY, PHYSIOLOGY, AND MICROSCOPICAL ANATOMY. Born at Philadelphia, 1841.—*Glands of* (prepuce and labia).

Valentin, Gabriel Gustav, GERMAN PHYSIOLOGIST, 1810—1883.—*Ganglion of* (above second bicuspid).

Valsalva, A., PROFESSOR OF ANATOMY AT BOLOGNA, 1660—1723.—*Sinus of.*

Varolius, Constanzo, ITALIAN ANATOMIST, 1543—1575.—*Pons Varolii.*

Vater, Abraham, GERMAN ANATOMIST, 1684—1751.—*Corpuscles of* (Pacinian).

Verga, Andrea, ITALIAN PHYSICIAN AND ANATOMIST.—*Ventricle of* (in fornix).

Verheyen, Phillppe, GERMAN ANATOMIST, 1648—1710.—*Venæ stellatæ of* (kidney).

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Vesalius, A. (Belgian by birth), PROFESSOR OF ANATOMY IN PADUA, 1514—1564.—*Foramen, glands, ligament, and veins of.*

Vicq D'Azyr, F., PROFESSOR OF ANATOMY IN PARIS, 1748—1794.—*Bundle of; Foramen of; White line of.*

Vidlus, Vidus (Guido Guidi), FLORENTINE PHYSICIAN; PROFESSOR OF MEDICINE IN PARIS, 1569.—*Vidian Artery* (internal maxillary); *Vidian canal, foramen, and nerve.*

Vieussens, R., FRENCH ANATOMIST, 1641—1716.—*Valve of* (brain); *Ganglion of* (solar plexus); *Corpus album subrotundum Vieussenii* (anterior tubercle of optic thalamus); *Ansa of* (sympathetic in neck).

von Wachendorf, Eberhard Jacob, PROFESSOR OF CHEMISTRY IN UTRECHT (*Membrane* described 1740).—*Membrane of* (fœtal eye).

Walter, Johann G., GERMAN ANATOMIST, 1734—1818.—*Ganglion of* (coccygeal).

Walther, Johann Adam, GERMAN PHYSICIAN (Diss. *De humanæ linguæ natura*, 1806).—*Ducts of* (sublingual).

Weber, Ernst Heinrich, GERMAN PHYSIOLOGIST, 1795—1878.—*Glands of* (tongue).

Wernicke, Karl, GERMAN NEUROLOGIST, 1848—.—*Fissure of* (vertical fissure at end of fissure of Sylvius).

Westphal, Karl Friedrich, GERMAN PHYSICIAN, 1833—.—*Nucleus of.*

Weitbrecht, Josias (born at Württemberg), ANATOMIST IN ST. PETERSBURG, 1702—1747.—*Cord of*, or *ligament of* (orbicular ligament of elbow).

Wernekink, .—*Commissure of* (decussation of prepeduncle in cerebellum).

Wharton, T., ENGLISH ANATOMIST, 1610—1673.—*Wharton's canal and duct; Wharton's jelly.*

Wilder, B. G., AMERICAN ANATOMIST (present time).—*Fissure of* (amygdaline, in brain).

Willis, Thomas, ENGLISH PHYSICIAN, 1622—1675.—*Circle of; Chords of* (in superior longitudinal sinus); *Nerve of* (spinal accessory); *Glands of; Numbering of cranial nerves.*

Wilson, James Arthur, ENGLISH PHYSICIAN AND ANATOMIST, 1795—1883.—*Muscle of* (constrictor urethræ).

Winslow, J. B. (a Dane), PROFESSOR OF ANATOMY IN PARIS, 1669—1760.—*Foramen of; Ligament of* (knee-joint).

Wirsung, Johann Georg, GERMAN PHYSICIAN, born in 1643.—*Canal of* (pancreatic duct).

Wolff, Kaspar Friedrich, GERMAN ANATOMIST, 1733—1794.—*Wolffian bodies.*

Woolner, Thomas, ENGLISH SCULPTOR AND POET, 1826—1892.—*Woolner's tip* (helical apex of ear).

Worm, Ole, DANISH PHYSICIAN, 1588—1654.—*Wormian bones.*

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Wrisberg, H. A., PROFESSOR OF ANATOMY AT UNIVERSITY OF GÖTTINGEN, 1739—1808.—*Nerve of; Cartilages of; Ganglion of* (heart); *Ligament of* (knee).

Wutzer, Karl Wilhelm, GERMAN SURGEON, 1789—1863.—*Ganglion of.*

Zinn, Johann Gottfried, GERMAN OPHTHALMOLOGIST AND ANATOMIST, 1727—1759.—*Ligament of; Corona of* (arterial); *Central artery of* (retina); *Zonule of; Membrane of* (lamina iridis anterior).

Zuckerkandl, E., PROFESSOR OF ANATOMY IN VIENNA (present time). —*Convolution of* (subcallosal).

CLINICAL MEMORANDA,

BEING SELECTED CASES FROM THE WARDS OF

DR. M'CALL ANDERSON,
Professor of Clinical Medicine in the University of Glasgow.

(REPORTED BY W. ERNEST THOMSON, M.D.)

XVI.

33. *Affection of the Knee-joints consequent upon Hereditary Syphilis.*

R. B., aged 7, was admitted to Ward VII on 21st May, 1895, complaining of pain and swelling about the knee-joints of four weeks' duration.

There is a history of syphilis in the mother, and the child, although hitherto able to go about and attend school, has always been rather delicate; he had whooping-cough at two years, and congestion of the lungs at four years of age.

Four weeks before admission, he complained of pain in the knees, and his mother then found that both knees were swollen, hot, and tender to manipulation. Under medical advice he was put to bed, and fomentations and ointments applied, but without success. The pain increased, and the mother noticed that he lay with the legs drawn up, and that the skin over the joints was warmer than elsewhere. No other joints have been affected, nor does she think he has been feverish. The following is the report of his condition on admission:—

Both knees present a uniform swelling, which obscures the natural conformation of parts and the relations of the bony

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prominences. The swelling is of a tense, elastic, and semi-fluctuant character. The patellæ are raised a little from the underlying parts, but do not, when tapped, give quite the usual sensation of being floated in a fluid, although there can be little doubt that some fluid is present. There is a distinct bulging to the inner and also to the outer sides of the joints, and this is increased in proportion to the amount of flexion. The lower end of the femur and the head of the tibia are enlarged in both limbs; the temperature of the overlying skin is raised, and there is slight redness.

The patient is unable to extend the legs, owing to the swelling and to the pain experienced; but flexion is not affected to such an extent, for by exerting slight pressure the movement can be made almost normal in extent.

The eyes are the seat of active interstitial keratitis, most advanced in the left.

The lungs, heart, liver, and kidneys are normal.

Treatment and Progress.—Treatment at first consisted in rest and ordinary diet, with half-drachm doses of iodide of starch thrice daily. After ten days, during which improvement had been but slight, mercurial ointment was applied daily round the knees. The starch iodide was stopped. By 20th June there was great improvement. The legs could be almost fully extended, and the patellæ could be moved from side to side. Thickening of the bones was still marked, but the tenseness about the joints had almost disappeared. The keratitis was taking its usual course, clearing up in the left eye while now at its height in the right.

On 2nd August a note was made that both legs could be fully extended and manipulated without causing pain. There was still thickening of bones and synovial membrane, with a certain amount of fluid in the joints.

He made good progress, and was sent home on 28th September. His knees had been massaged during the last month of his stay, and had greatly improved. Though hobbling a little, his gait was very much improved. There was still bony thickening, but the fluid had all disappeared from the joints, and no pain was complained of on manipulation. The cornea had cleared up well.

34. *Case of Raynaud's Disease.*

M. H., a schoolgirl, 8 years of age, was admitted on the 17th April, 1895, with a history of periodic swelling and discolouration of the hands for four years, and of the feet for four months.

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The family history is quite satisfactory, so also is that of the child herself, who, indeed, but for the affection of the extremities, looks a model of healthy and lively childhood. When 4 years of age she had measles, and made a good recovery. Two months later her mother noticed swelling and discolouration of the hands when the child came home from school. The three centre fingers of each hand were cold, swollen, and red; and, as far as can be gathered from the somewhat scrappy history obtained, there were tingling sensations and some degree of pain associated with this condition, which lasted often for the rest of the day, and, except for slight puffiness about the fingers, was absent next morning.

Since then the swelling and discolouration during the attacks have become more marked, and the child has sometimes cried out with pain. The calf of the left leg and the left cheek have been occasionally affected, and about four months ago the toes became subject to similar attacks.

When she came into hospital nothing was to be seen except slight swelling of the phalanges of both hands; but, after she had had her bath, the hands became swollen and red, and the fingers bluish-red, as if affected with chilblains. Next morning (18th April) the discolouration had gone.

On the following afternoon (19th April) another attack came on, and was carefully noted as follows:—

"Both hands are red and swollen, and the finger tips are purple—*local asphyxia.* The discolouration fades away to the normal about 2 inches above the wrists. The toes are affected in a lighter degree. Pressure on the palm or dorsum causes blanching, which persists for an abnormally long time. The hands and feet are very distinctly cold compared with other parts, and feel boggy to the examining finger. No other parts but the hands and toes are affected at present. The patient, who is of a distinctly heroic temperament when pain is concerned, will not admit that there is any pain in the parts, but only numbness, coldness, and tingling. Elevation of the arms and rubbing the fingers have no effect on the condition."

Local syncope has never been noticed between the attacks. Some thickening of all the tissues, however, persists. Sensation appears to be practically normal.

Certain negative points, if they may be so called, require enumeration:—

1. There is no irritability of temper. She is the best child in the ward, and is particularly amiable in disposition.
2. The heart is apparently normal. Pulse 80.

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3. Urine is normal; no albumen, sugar, or abnormal blood derivatives.

4. Temperature is normal.

5. There is no alteration visible in the blood corpuscles, and the percentage of hæmoglobin is normal.

6. There is no constriction of the retinal arteries such as has been described.

7. As mentioned previously, the general health is excellent.

Treatment consisted at first in general tonic *régime*, and, after observation for some days, a daily application of the continuous current (20 *Leclanché* cells) was commenced. The positive pole was applied over the spine, and the hands or feet placed in salt water along with the negative pole.

Progress.—By 12th June there seemed to be some improvement, both as regards frequency of occurrence and severity of the attacks. On 2nd August a note was made stating that the patient remained *in statu quo;* general health excellent. On 31st August she was sent home. There had been no further development in the case, and little could be stated as to any marked improvement. Latterly, whether or not owing to mildness of the weather, the attacks of local asphyxia had been less frequent.

35. *Case of Raynaud's Disease.*

J. R., schoolboy, aged 5 years, was admitted to Ward VII on 27th July, 1895, with a history of intermittent discolouration of the ears, the feet, and the hands, for two years.

The family history is unimportant, and the patient's only illness, prior to the present one, was an attack of some acute lung disease when 2 years old.

About two years ago, during the winter, his mother first noticed a bluish discolouration of the extremities, which she supposed was due to the cold weather. But the condition has persistently returned since then at irregular intervals, in summer as well as in winter. She describes the blueness as "coming and going" in the fingers and toes, sometimes also affecting the tips of the ears, and lasting usually for a few hours. She is not very sure whether it has ever been painful. She has not noticed any unusual pallor of the parts prior to the attacks, nor that they are influenced by the use of hot or cold water. None of the child's relatives have had any similar disease.

When examined after admission, there was a faint blush only to be seen on the fingers, which had a puffy appearance, and felt thickened. The toes and the outer borders of the

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soles were slightly livid. Pressure with the fingers caused considerable pain, and led to blanching, which disappeared more slowly than normal. The following day the ears were quite livid, the hands and toes normal. There was no pain in the discoloured area.

Treatment consisted at first in cod liver oil and thyroid feeding. The latter disagreed and was stopped. Extract of malt was added to the cod liver oil, and this treatment continued.

About six weeks after admission, interstitial keratitis developed. This was treated locally, and in due time began to improve. About the end of September there was threatened gangrene of the tips of both ears, which, however, ended in a slight superficial slough of epidermis in the right ear. On 21st October nitro-glycerine was commenced, $\frac{1}{100}$ gr. twice daily. No constitutional effects resulted. On 23rd October the fingers, toes, and ears were unusually livid, and he was given $\frac{1}{100}$ gr. of nitro-glycerine. Within twenty minutes of its administration the skin was quite pale. Since then this dose has been repeated when the attacks came on, but has failed to have a similar good effect. The nitro-glycerine having failed to afford relief, he is now about to be treated by electricity.

36. *Case of Multiple Neuritis.*

J. M'L., aged 14, coal miner, was admitted to Ward II on 6th September, 1895, complaining of loss of power in the arms below the elbows, and in the legs below the knees. These symptoms appeared seven weeks before admission.

No light is thrown on the case by the family history.

Previous to the onset of this illness the patient has been healthy, except for the usual illnesses of childhood, including scarlatina and measles. He looks a healthy, well-nourished lad, but is very tall and heavy for his age (height, 5 ft. 8 in.; weight, two months ago, 10 st. 7 lb.). At 11 years of age he left school and commenced work in a pit, work which involved much stooping, occasionally in damp places. No accident has ever happened to him, and he is of temperate habits.

The illness commenced seven weeks previous to admission, with numbness of the finger tips, spreading to the hands and fore-arms, and almost simultaneously affecting the toes and feet, associated with a feeling of weakness and slight pain, such as are apt to occur after too much exercise. This weakness, which principally affects the arm and leg below the elbow and knee, has gradually increased up to the time

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of admission, and three weeks after its onset necessitated his giving up work. For the last fortnight manipulation of the muscles in the arms and legs has caused pain.

A short time ago—whether prior to the onset of symptoms or not he is unable to recollect—he attended the doctor for slight sore throat. (There was no difficulty in swallowing at any time, nor can any definite reason be assigned for supposing this sore throat was diphtheritic.)

Prior to this illness neither his work nor play were such as to call for extreme exercise of muscles, nor had he been specially exposed to cold or wet. He is not aware of having been feverish since the illness commenced. He does not know of any impurity in the drinking water at his home, and he had not been taking any kind of medicine. Although his growth has been very rapid for two years, "growing pains" have never troubled him. He is not aware of any loss of flesh, and the appetite is much as usual.

Examination of the Upper Extremities.—The muscles are distinctly flabby. The thenar and hypothenar eminences are soft, and there is atrophy of the interosseous muscles, as well as of the extensors of the fore-arm. The fingers can be abducted from the middle line, but adduction is imperfect. The whole upper limb appears to be paretic, but the weakness is most marked below the elbow. Although wrist-drop is absent, the extensor muscles seem to be the weakest. The dynamometer grip is 5 kilograms in the right hand, 0 in the left.

The temperature sense is normal, but there is slight analgesia on the dorsal aspect of the fingers, hands, and lower part of the fore-arm. In addition, anæsthesia of the tips of the fingers is present; he cannot pick up a small object, such as a pin, without difficulty, and cannot hold a pen properly.

There is no triceps reflex, and only a faint wrist reflex in either arm.

Examination of Lower Extremities.—Atrophy of the lower limbs is not marked, but the calf muscles are flabby, and the extensors of the toes are atrophied. There is distinct paresis of the legs, especially of the extensor muscles, as shown by the foot-drop, and consequent tripping as he walks. The gait is very unsteady. He cannot raise himself on the toes. There is slight anæsthesia and analgesia over the dorsum of the foot and along the inner surface of the lower two-thirds of the leg.

On manipulation of the legs he complains of some pain, but pressure over the nerve trunks does not materially increase it.

No deep reflexes are obtainable.

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The Trunk.—The superficial reflexes are present.

Equilibration with the eyes closed and feet together is impossible.

Treatment and Progress.—Massage and the application of the continuous current were ordered, with strychnine internally.

On 28th September, although there was some improvement in the grasp and in the finger movements, there was distinct paresis of the muscles above the elbow as well as of those below; and the appearance of the supra- and infra-spinatus regions was suggestive of atrophy.

On 9th October there was slight improvement of the grasp in the right hand, but still defective tactile sensation at the right finger tips. Other parts of the right hand and arm and all the left had practically normal sensation. He was conscious of slight improvement in walking. The condition of the muscles was very much as before.

On the 15th October Dr. Love examined the muscles electrically, and was of opinion that, both as regarded polar changes and the slow character of the contractions obtained, there was distinct evidence of partial reaction of degeneration.

Since this date he has been slowly but steadily improving, and there is little doubt of his ultimate recovery.

A HISTORY OF THE CHRONIC DEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM.

By T. K. MONRO, M.A., M.D.,

Fellow of the Faculty of Physicians and Surgeons of Glasgow; Assistant Physician to the Royal Infirmary, and Pathologist to the Victoria Infirmary of Glasgow.

(*Continued from* p. 354.)

VI. HISTORY OF BULBAR PARALYSIS.

NOMENCLATURE.

Chronic bulbar paralysis.
Progressive muscular paralysis of the tongue, soft palate, and lips (*Duchenne*).
Progressive bulbar paralysis (*Wachsmuth*).
Glosso-labio-pharyngeal paralysis.
Bulbar nuclear paralysis (*Kussmaul*).
Progressive atrophic bulbar paralysis (*Leyden*).
Glosso-laryngeal paralysis (*Trousseau*).
Glosso-labio-laryngeal paralysis (*Duchenne*).

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HISTORY.

The first published account of this disease in which it was recognised as a distinct affection appeared in 1860 in a paper by Duchenne, with the title "Paralysie musculaire progressive de la langue, du voile du palais, et des lèvres."[1]

In the preceding year, Duménil of Rouen had recorded a case of great importance from a historical point of view. It was one of progressive muscular atrophy of the usual kind, complicated, however, with non-atrophic paralysis of the muscles supplied by certain of the nerves arising from the medulla oblongata. At the *post-mortem*, the anterior spinal roots were found to be atrophied; but the bulbar nerves were also atrophied. Duménil therefore inferred that the cranial motor nerves have not the same influence as the spinal motor nerves over the nutrition of muscles.[2]

When Duchenne wrote in 1860, he said that his case was something entirely different from progressive muscular atrophy. The latter, he said, was a lesion of muscular nutrition without paralysis; whereas the disease he was now describing was an instance of paralysis without atrophy, a condition which might remain isolated from beginning to end, though of course it might happen to be complicated by some other ailment, whether progressive muscular atrophy or anything else. As to the pathology of this new disease, the muscles of the tongue, palate, and lips were obviously at fault; but whether on account of some lesion of the central nervous system, or some neurosis, he was not prepared to say.

The first time Duchenne saw a case of bulbar paralysis was in 1852. When he published the second edition of his great work in 1861, he had collected fifteen cases. Twenty years before this (1841), Trousseau had met with a case of which he wrote out a description at the time; this was laid aside for long, but after Duchenne published his paper, it was brought to light again in connection with the famous "Clinical Lectures" at the Hôtel-Dieu. Apparently Trousseau did not see a second case till November, 1860.[3]

Accordingly, when Duchenne met with a case of combined muscular atrophy and bulbar paralysis, he thought that a mere chance had brought together two distinct diseases in one individual. Trousseau confirmed Duchenne's clinical observations, but inclined to the belief that the concurrence was due, not to a mere coincidence, but to an identity of anatomical lesion—viz., atrophy of motor roots. He did not yet recognise the affection as a central one.

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The central character of the disease, and its connection with the medulla, were inferred, on theoretical grounds, by three German observers—viz., Baerwinkel of Leipsic (1860), Wachsmuth of Dorpat (1864), and Shultz of Vienna (1864). The first named shewed that the electrical reactions and other symptoms pointed to a central origin, while the distribution of the muscular affection corresponded to the medulla oblongata. Wachsmuth, in his important monograph, gave to the disease the now generally accepted designation, "Bulbar paralysis," and argued that the lesion must be seated in the region of the bulbar nuclei described by Stilling.

Duchenne had, in 1860, merely hinted at the possibility of some central lesion, "anatomical or dynamic," affecting the origin of the bulbar nerves; but, as he himself says, he was here brought to a standstill until 1867, when the magnificent researches of Lockhart Clarke on the minute structure of the medulla threw a flood of new light on this obscure subject.

In 1869, Charcot and Joffroy published two cases of progressive muscular atrophy, in which the lips and tongue, besides the more commonly affected parts of the body, were involved. In each instance, they found, after death, atrophy of anterior spinal roots and of the hypoglossal and accessory nerves, with atrophy of the lateral columns, and extreme wasting of the ganglion-cells of the anterior cornua.

Leyden (1870 and later) published several cases of a similar kind, and mentioned disappearance of ganglion-cells in the hypoglossal nucleus.

Microscopic examination yielded confirmatory results in the case of Kussmaul and Maier in 1873.[4]

In 1870, Charcot expressed his belief that the morbid process attacks the motor nerve-cell in the first instance.[5]

As has been remarked, Trousseau believed that progressive muscular atrophy and bulbar paralysis are due to the same form of anatomical lesion. At the same time, he said that Duchenne was right in separating the two diseases, because the progress of the affection is different in the two cases. Kussmaul (1873) was perhaps the first who unreservedly urged[6] the identity of the two diseases, and no effectual attempt has been made since then to separate them.

Friedreich (1873) naturally opposed the neuropathic theory of bulbar paralysis. Duchenne and Joffroy (1870) had, as they believed, a formidable difficulty to deal with. They recognised in progressive muscular atrophy an atrophy without paralysis, and in glosso-laryngeal paralysis, a paralysis without

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atrophy. Yet in both cases the muscular affection was apparently dependent on changes in motor nerve-cells. They therefore argued that these nerve-cells must have two important functions, the one trophic, the other motor; and they completed their theory by saying that in the one disease only the motor, and in the other only the trophic function of the cells is impaired. Friedreich condemned all this as an unwarrantable assumption, and said that in glosso-labio-laryngeal paralysis, as in progressive muscular atrophy, the changes in the nerve-cells are secondary to those in the muscles.[7]

He in his turn had to answer the question why progressive muscular atrophy and bulbar paralysis are so often met with together in the same patient. The reason, he said, is that the two are related as cause and effect. The more general muscular affection is the cause of bulbar paralysis. The connecting link between the two is an ascending neuritis. This begins in the nerves of the muscles involved in progressive muscular atrophy, and extends upwards till it reaches the cervical portion of the spinal cord. From this it readily passes to the medulla oblongata, and when it reaches the floor of the fourth ventricle, it can give rise to the symptoms of bulbar paralysis.

The question of muscular wasting in bulbar paralysis has been a bugbear to writers on the subject. It seems so contrary to what we should anticipate that there should not be wasting, and yet there was no feature of the disease on which Duchenne insisted more emphatically, and we know how careful he was to get his clinical information at first hand.[8] On the other hand, Kussmaul says the tongue is most commonly seen to be atrophied,[9] and Leyden speaks of the disease as characterised by muscular atrophy from the beginning.[10] As a matter of fact, it would appear that the most diverse conditions of the tongue have been met with in different cases. The tissue of the organ may be considerably altered in its characters without its bulk as a whole being appreciably diminished, and indeed without its naked-eye appearances being in any respect different from the normal. A remarkable case of this kind is recorded by Charcot.[11] Wasting, again, may be very considerable, or it may be absent. We should be prepared, on theoretical grounds, to meet with instances of the last mentioned condition, because it is natural to expect that degeneration will sometimes occur in the upper segment only of the motor path between the cerebral cortex and those muscles which are innervated by the bulbar nerves

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—a change analogous to primary lateral sclerosis of the cord, in connection with which there is, of course, no muscular wasting.[12]

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[2] *Gaz. Hebd.*, June, 1859, tom. vi.
[3] Trousseau's *Lectures on Clinical Medicine*, New Sydenham Society, 1868, vol. i, p. 117.
[4] See Kussmaul on Bulbar Paralysis, *German Clinical Lectures*, New Sydenham Society, 1876.
[5] An extract from Charcot's paper is given in the second volume of the New Sydenham Society's edition of Charcot's *Lectures on Diseases of the Nervous System*, 1881.
[6] Kussmaul, *loc. cit.*
[7] Friedreich, *Ueber Progressive Muskelatrophie*, &c., 1873.
[8] Selected Works of Duchenne, New Sydenham Society.
[9] Kussmaul, *loc. cit.*
[10] *Klinik der Rückenmarkskrankheiten*, 1875, Bd. ii, S. 524.
[11] *Lectures on Diseases of the Nervous System* (second series), New Sydenham Society, p. 374.
[12] See Gowers, *Diseases of the Nervous System* (second edition), 1893, vol. ii, p. 570.

VII. HISTORY OF OPHTHALMOPLEGIA.

NOMENCLATURE.

Chronic, or progressive ophthalmoplegia.
Chronic nuclear ocular palsy.
Combined palsy of the ocular nerves.
Progressive palsy of the ocular muscles.
Progressive paralysis of the cerebral nerves.

HISTORY.

The term "ophthalmoplegia" is said to have been first used by Brümmer in 1850, to signify complete paralysis of the third nerve or pair of nerves. At a later date, Graefe used the expression "ophthalmoplegia progressiva," to indicate the condition now generally known by this name. In 1856, this author published a case of almost complete paralysis of the ocular muscles. Vision, however, and accommodation were intact; the pupil contracted during accommodation, but not on stimulation by light; the levator palpebræ acted perfectly on the right side, but imperfectly on the left side.[1]

Dr. Gowers states [2] that Graefe compared these ocular palsies with bulbar paralysis in 1868, and that Förster correctly localised the lesion, so far as concerns the external ocular muscles, in 1878.

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Writing in 1873, Kussmaul stated that an attempt had been made, for instance by Benedikt, to extend the notion of bulbar paralysis, so as to include a progressive palsy of the cerebral nerves. As yet, however, no undoubted case of the kind had been recorded.[3]

In 1878, Mr. Jonathan Hutchinson proposed the designation "ophthalmoplegia interna" for a set of cases characterised by palsy of the internal muscles of the eye; palsy, that is, of the ciliary muscle, and of both circular and radiating fibres of the iris. Mr. Hutchinson had seen his first case in 1865. The facts of his eight cases suggested that the disease was nearly always due to syphilis, and that the lesion was probably in the lenticular ganglion, though conceivably it might be near the nucleus of the third nerve; but as the patients were all alive, there was as yet no *post-mortem* evidence to go upon.[4]

In the communication just referred to, Mr. Hutchinson proposed the name "ophthalmoplegia externa" for cases of symmetrical immobility of the eyes, with ptosis; that is, for cases of paralysis of the external ocular muscles. Mr. Hutchinson gave an account of fifteen cases of this kind in a paper published in the following year. He considered the initial lesion to be probably seated in the nuclei of the affected nerves, and to be, in most cases, a consequence of syphilis. The ocular palsies were occasionally associated with symptoms of locomotor ataxy, or with evidence of damage to the fifth, seventh, or eighth cranial nerve. No similar cases had as yet been recorded in England. The writer, who mentioned that Graefe recorded examples of this condition in 1867, and used the term "ophthalmoplegia" in connection with them, saw the first of his fifteen cases in 1862. His third case was under observation from beginning to end (1869 to 1876), and furnished the only autopsy. This patient always denied having had syphilis, and no signs or history of any syphilitic affection could be made out; moreover, two of his children whom he brought presented no suspicious sign. At last, however, in 1876, his eldest child, a girl aged twenty, was sent to Mr. Hutchinson with characteristic syphilitic keratitis, and she was then found to have notched teeth also.

When this man died, Dr. Gowers examined his brain and found in the nuclei of the third, fourth, and sixth nerves, changes similar to those which occur in the anterior cornua of the cord in progressive muscular atrophy.[5]

One of the earliest systematic writers to allude to ophthalmoplegia was Eulenburg of Greifswald, but there is practically nothing of historical importance in his chapter on this subject.[6]

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Finally, reference ought to be made to an admirable address by Professor Ferrier on "The Pathology and Distribution of Atrophic Paralyses" (1893).[7]

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[2] *Diseases of the Nervous System* (second edition), vol. ii, p. 194, note.
[3] See Kussmaul on Bulbar Paralysis, *German Clinical Lectures*, New Sydenham Society, 1876, p. 42 *et seq.*
[4] *Medico-Chirurgical Transactions*, 1878, vol. lxi.
[5] *Ibid*, 1879, vol. lxii ; *Lancet*, February, 1879.
[6] *Lehrbuch der Nervenkrankheiten*, 1878, zweite Auflage, Bd. ii.
[7] *British Medical Journal*, 30th September, 1893.

VIII. HISTORY OF THE PERONEAL TYPE OF MUSCULAR ATROPHY.

NOMENCLATURE.

Peroneal type of progressive muscular atrophy (*Tooth*).
Peroneal type of family amyotrophy (*Gowers*).
Charcot-Marie type of progressive muscular atrophy.
Leg type of progressive muscular atrophy (*Sachs*).
Progressive neurotic muscular atrophy (*Hoffmann*).
Femoro-tibial type of Eichhorst (*Landouzy and Déjérine*).
Wetherbee ail.

HISTORY.

A short account may be given of the history of this disease, which still occupies a somewhat indeterminate nosographical position. It was first treated of as a distinct variety of muscular atrophy by Charcot and Marie in February, 1886.[1] These authors gave five cases of their own, and their paper contained abstracts of cases already recorded by other writers. Charcot and Marie thought that this disease was not a primary myopathy. Whether it was a myelopathy or multiple peripheral neuritis they considered doubtful; but they rather favoured the idea that it was myelopathic.

Later in the same year this affection was described (quite independently) by Dr. Howard Tooth, in his Cambridge Graduation Thesis, under the title of "The Peroneal Type of Progressive Muscular Atrophy," a designation which has come into very general use.[2]

A considerable number of cases of this affection had been described before 1886; but the peculiar features of the disease

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had, in some instances, not been fully appreciated. Among those who published such cases were Eulenburg (1856), Eichhorst (1873), Friedreich, Oppenheimer, Ormerod[3] (1884), and Schultze (1884).

The "Wetherbee ail" probably corresponds most nearly to this malady. It is so called after a family named Wetherbee, many members of which were sufferers. Their pathological history was related by one of their number, E. H. Wetherbee, and was published by Hammond. E. H. Wetherbee and his father did not begin to suffer till they reached the age of thirty-nine; but the manner in which the disease affected the family generally makes it pretty evident that it was of the peroneal type. It began in the lower limbs, and fibrillary contractions often took place in the affected muscles.

An extensive family tree, showing many individuals affected by this disease, was published by Herringham in 1888.[4]

German neurologists declined at first, after Charcot, Marie, and Tooth published their researches, to admit an additional type of muscular atrophy; but ultimately Erb gave in his adhesion to the new views, as was shown by the communication published by his assistant Hoffmann in 1889.

The hitherto indeterminate pathology of this disease has been already adverted to. It will be sufficient here to mention some of the theories that have been held.

Schultze supposed his cases to be instances of multiple peripheral lesions. Landouzy and Déjérine, commenting on the observations of Eichhorst, Hammond, and Ormerod, expressed the opinion that the disease is a myopathy. Charcot and Marie thought it either multiple neuritis or spinal, probably the latter. Tooth and Hoffmann think it a degenerative neuritis. Gowers thinks that, in different cases, nerves or muscles or both may be at fault. Sachs has suggested that this disease, as the "leg type of progressive muscular atrophy," is strictly comparable to the "arm type" (Duchenne's type), the difference being that hereditary influence is not so clearly proved in the arm type of Duchenne as in the other. Finally, Ferrier considers the peroneal type to be "primarily a hereditary myelopathy, occasionally complicated by neuritic changes, probably of a secondary character."[5]

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[2] See Tooth, *Brain*, July, 1887, vol. x, pp. 243-253.

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[3] Ormerod, "Muscular Atrophy after Measles in Three Members of a Family," *Brain*, October, 1884, vol vii, p. 334.
[4] *Brain*, June, 1888, vol. xi.
[5] See Schultze, *Berl. Klin. Woch.*, 13th October, 1884, No. 41; Charcot et Marie, *loc. cit.*; Gowers, *Diseases of the Nervous System* (second edition), vol. i, p. 534; Sachs, *Brain*, 1889-90, vol. xii; Ferrier, *British Medical Journal*, 30th September, 1893.

IX. HISTORY OF DISSEMINATED SCLEROSIS.

NOMENCLATURE.

Disseminated sclerosis (sclérose en plaques disseminées).
Multiple sclerosis (with cerebrospinal, cerebral, and spinal varieties).
Insular sclerosis (*Moxon*).
Multilocular sclerosis.
Polynesic sclerosis.
Charcot's disease (*Althaus*).

HISTORY.

The history of this disease does not take long to write, partly because its evolution as a clinical and anatomical type is due largely to the labours of a very few individuals, and partly because, so far as our knowledge yet goes, its morbid anatomy and physiology are exceedingly simple when viewed alongside those of that highly complex entity, *tabes*, whose history is much older than that of modern neurology, and whose pathology still bulks so largely in the scientific study of chronic disease of the spinal cord.

It is generally stated by writers on the subject, that the lesions of multiple sclerosis were figured long ago by Cruveilhier and Carswell. Personally, I am not quite satisfied, after an examination of Cruveilhier's plates,[1] that the lesions he figures are those of this disease, although, when we remember the admirable field he had at his command, it seems exceedingly likely, *a priori*, that he *would* meet with genuine examples. One case figured by Carswell,[2] however, seems to be an undoubted instance.

Ludwig Türck (1855) recorded some examples, but he studied them only from the physiological point of view; so that apparently the disease had been lost sight of for a good many years.

Rokitansky, in his text-book, describes as being probably one of the results of encephalitis, a condition which corresponds fairly well to the lesion of disseminated sclerosis.[3]

In 1849, Frerichs recorded a case in which, for the first time, an earnest attempt was made to study the disease clinically, and to make a diagnosis during life.

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In 1856, Valentiner published an article dealing with several instances of this disease, in which Frerichs, in his clinique at Breslau, had made a diagnosis during life.

In 1863, Rindfleisch of Zurich wrote a very important account of the histology of the disease. There is, he says, in the brain and cord, what Rokitansky would have called a focal increase of the interstitial tissue. Rindfleisch's work has not ceased to be of value. He states that the appearances point to the disease as starting in single blood-vessels with their branches. All the vessels in the diseased area, and also those in the immediate neighbourhood which still traverse healthy parenchyma, are in a condition which is characteristic of chronic inflammation. We must therefore, he says, distinguish three processes which run on in close association with one another: (1) changes in the vessels; (2) atrophy of the nervous elements; (3) metamorphosis of the connective tissue.[4]

Vulpian and Charcot recorded some fresh cases in 1862, and about this time the subject was taken up for thorough examination at the Salpêtrière. The results of Charcot's labours are embodied in a lecture delivered in 1868, which still constitutes—as regards typical cases at any rate—our standard description of the disease.[5]

Paralysis agitans was the disease with which disseminated sclerosis was particularly liable to be confounded. Charcot, in inspiring the thesis of his pupil Ordenstein (1867), endeavoured to make plain the difference between the two. In his lecture already referred to, Charcot alludes to a case reported by Baerwinkel some ten years before. The patient, during life, was under Skoda's care, and the symptoms were carefully investigated and faithfully noted. In particular, it was observed that tremor showed itself only when voluntary movements were attempted. Paralysis agitans was the diagnosis arrived at, but after death, patches of sclerosis were found disseminated through all parts of the cerebro-spinal axis.

Again, a case recorded by Zenker, about 1865, was found at the autopsy to be one of multiple sclerosis. Yet Professor Hasse had made the diagnosis of paralysis agitans, though in the clinical notes emphasis was laid on the fact that tremor only showed itself on voluntary effort, or under the influence of emotion.

Charcot, lecturing in 1868, said that the disease was not yet known in England. At the Clinical Society of London, on the 9th April, 1875, Dr. Buzzard shewed a case of disseminated sclerosis, and a case of paralysis agitans (two diseases which

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Charcot had differentiated one from the other).[6] "Two cases of insular sclerosis of the brain and spinal cord" were recorded in papers published by Dr. Moxon in the same year.[7]

As has been already hinted, Charcot's description left but little to be added to a complete sketch of multiple sclerosis. It may be well, however, specially to state that Charcot first called attention to the persistence of the axis-cylinders—an observation which has been abundantly confirmed by later investigators. The same observer showed that the lesion is interstitial. Valentiner (1856) and Baerwinkel described isolated cases in which nystagmus was a symptom. Ordenstein (1867), Charcot, and Bourneville and Guérard (1869) shewed that nystagmus is a symptom of much importance in multiple sclerosis. Charcot found it present in about half the cases.[8]

The theory of Rindfleisch that the disease begins in the vessels did not at first meet with general acceptance, but there appears to be a disposition on the part of some writers nowadays to view it more favourably. Dr. Pierre Marie, accepting this doctrine, thinks that the disseminated sclerotic foci arise through embolisms, and he has, since 1884, urged the importance of a preceding attack of some infectious disease in the etiology of multiple sclerosis.[9]

A word may be added here with regard to the nomenclature of this disease. "Inselförmige Sklerose," "insular sclerosis," "polynesic sclerosis," are among the designations employed for the general condition, and the foci of disease are spoken of as "islets" of sclerosis. Leube states[10] that Cruveilhier used the expression "îles" for the little grey patches of disease in the brain. The idea involved in the word "island" seems therefore to have commended itself to writers of various nationalities.

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[2] *Illustrations of the Elementary Forms of Disease*, 1838, chapter on "Atrophy," plate iv.

[3] *Handbuch der Pathologischen Anatomie*, 1844, Bd. ii, S. 816.

[4] "Histologisches Detail zu der Grauen Degeneration von Gehirn und Rückenmark," Virchow's *Archiv*, 1863, Bd. xxvi.

[5] Charcot, *Diseases of the Nervous System*, New Sydenham Society, 1877, vol. i.

[6] *Lancet*, 17th April, 1875, p. 545.

[7] *Ib.*, 13th April and 1st May, 1875, pp. 471, 609.

[8] See Friedreich, Virchow's *Archiv*, 1876, Bd. lxviii, S. 186.

[9] *Lectures on Diseases of the Spinal Cord*, New Sydenham Society, 1895.

[10] "Ueber Multiple Inselförmige Sklerose des Gehirns und Rückenmarks," *Deut. Arch. f. Klin. Med.*, 1870, Bd. viii.

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PUBLIC HEALTH.

A CONTRIBUTION TO THE METEOROLOGY OF SPORADIC PNEUMONIA.[1]

BY JOHN CHARLES, M.D.

THE diversity of opinion which prevails in regard to the relationship of weather conditions to acute pneumonia is somewhat surprising, especially when it is remembered that the group of diseases in which pneumonia is usually classed is known to be influenced by weather changes in a definite and regular manner. This may be partly accounted for by the fact that pneumonia is, strictly speaking, not so much an inflammatory affection of the lung as a specific fever, whose manifestations are specially localised in the lung substance. But this does not explain the disparity in the opinions of writers with regard to the meteorological relations of the disease itself, nor does the contention of Seibert,[2] "that the conclusions arrived at by some authorities are based on imperfect observation or insufficient appreciation of the variable meteorological states," seem worthy of serious consideration, or even justified by the evidence adduced.

The causes which have given rise to these disparities are many and various; but it would serve no useful purpose to discuss them here in detail. Some of the discrepancies are, doubtless, traceable to a somewhat loose application of the term pneumonia, and some, on the other hand, to the fact, so frequently overlooked, that in this disease we have not to deal with a "single clinical and ætiological thing bearing the name pneumonia,"[3] but with a disease whose ætiology, pathology, and clinical history are of considerable complexity. Several distinct varieties of pneumonia are now recognised—*e.g.*, epidemic, contagious, sporadic, septic, &c.—differing somewhat in their pathological characters and clinical features,

[1] Brief abstract of commended thesis for the M.D. degree (Glasgow), July, 1895.

[2] *American Journal of Medical Science*, January, 1882, quoted from Sturges' *Natural History and Relations of Pneumonia*, p. 301.

[3] Hirsch, *Historical and Geographical Pathology*, Sydenham Society's translation, p. 151.

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acknowledging probably different causes, and influenced by the weather more or less differently.

It is obvious that if these varieties are grouped together indiscriminately under one common head, as is the case in most statistical returns, the latter can hardly be regarded as affording evidence which, in any investigation into the meteorological relations of the disease, can be considered as beyond suspicion, but rather as likely to give rise to somewhat contradictory judgments.

Few, however, will feel disposed to dispute the observation of Seibert,[1] "that the question of the meteorological relations of pneumonia can only be thoroughly and scientifically decided by the collation of a large number of cases, within a comparatively short space of time, where the meteorological conditions have been exactly noted from day to day and in relation to one another;" and it was mainly this consideration that induced the writer to record an unusual experience of his own, in regard to this disease, during the winter of 1894-95. In a part of his practice acute pneumonia prevailed to an extent which was quite unprecedented in his five years' acquaintance with the neighbourhood. In this particular locality he had never in any year met with more than eight or ten cases of pneumonia; but during last winter—or rather the fourteen weeks between 1st November, 1894, and 12th February, 1895—no fewer than thirty cases came under his notice—that is to say, a three years' ordinary experience was compressed into the short space of three and a half months.

The cases were all of the sporadic variety, and, as far as could be made out, absolutely non-contagious. The sanitary condition of the locality was good, and, outside the pneumonia, the general health was unusually high for the time of year. There was no influenza,[2] and no zymotic diseases except three isolated cases of typhoid in a different part of the practice. There was scarcely any bronchitis, and, beyond some half-dozen cases of tonsillitis and acute rheumatism, pneumonia appeared to have the field entirely to itself.

The weather conditions during the time were, however, somewhat unusual; and, bearing in mind the exposed situation of the affected locality, the writer is disposed to regard them as agents of prime importance in the production of the outbreak.

The locality in which the pneumonia prevailed is a small

[1] *Op. cit.*, p. 302.

[2] Influenza did not make its appearance till a month later.

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stretch of land, about a mile in area, situated on the southern slope of the Derwent valley, about 14 miles N.W. of Newcastle-on-Tyne, and sloping downwards somewhat abruptly from an elevation of 700 feet to the river-side. The inhabitants, mainly coal-miners, live in roomy stone-built houses, arranged in three groups of rows. The largest group, accommodating some 900 people, is situated at the top of the hill; the other two groups of houses, containing each about 150 people, are placed, one midway down the hill, the other close to the river-side. The situation of these houses, although excellent from a sanitary point of view, is in some respects unfortunate. They are exposed (especially the highest group) in a most unusual way to the winds, particularly from the north and east; and when snow falls, being away from the sun's rays, it is slow to melt.

During the winter of 1894-95 the elements seemed focussed in all their intensity on this particular hill-side. Snow fell frequently, and for weeks together lay to a depth of 18 inches. In consequence of the frequent falls, the surface layer was always soft and damp; and with the strong winds from the north and east, the conditions were such as to try the endurance of the most robust. It is worthy of note that the pneumonia was severest in the exposed houses at the hill-top, and least of all on those near the river-side where the air was warmer, the winds lighter, and the snow less deep.

The most prominent meteorological feature of the winter of 1894-95 was the unusual mildness of November and December, and, on the other hand, the almost arctic severity which obtained from Christmas-time till the middle of February. The temperature did not once reach freezing point during November, and only on nine occasions in December; the diurnal variation during these months was, however, considerable (from 20° F. to 30° F). In January and February the temperature was much below the average for the time of year; indeed, some of the recorded temperatures were the lowest for half a century. The diurnal variation was, however, not extensive—rarely over 20° F. The rainfall in the first half of the winter was only 2 inches—a very low register indeed—and there was no snow whatever; but during the second half it rose high above the average, and was entirely in the form of snow. The wind varied considerably in force and direction throughout the winter. In the first half of November it was generally from the north or east; but during the rest of the month, and in December, south, south-west, and north-west winds prevailed. In January and February,

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east, north, and north-east winds were most common, particularly during the first week in these months.

The meteorological conditions were recorded by standard instruments, and the data carefully collected during the whole winter.

The conclusions arrived at by an analysis of these data, and by a careful investigation of the relations of the individual elements to the time incidence of the pneumonia cases, are briefly as follows:—

Wind.—The cases were most frequent in cold weather—say, of a mean temperature of 35° F.—when the wind had an east, north, or north-east direction, as in January, February, and end of December. But there was a considerable number of cases associated with a south or south-west wind (November), when the temperature for the time of year was far from low.

Rainfall.—In regard to the rainfall, the cases did not appear to observe any fixed relationship. They were frequent both with a low and with a high rainfall; but during the period (January) when the snow lay deepest, and was repeatedly being added to, the cases were more numerous than at any time during the whole winter.

Temperature.—The cases were most abundant when the weather was coldest, particularly if associated with a falling thermometer; and also during the milder weather, with a similarly inclined thermometer, when the diurnal variation was extensive (above 25° F. on an average). On the other hand, they were less frequent, if not altogether absent, when the temperature was moderately high and the diurnal variation slight.

These conclusions are based on too limited a number of cases to possess any but a corroborative value; and in this regard it is noteworthy that they agree, in the main, with the results of Sturges' critical investigation of the whole subject of the meteorology of pneumonia in his classical work,[1] and also, though perhaps more closely, with those of Seibert's inquiry into the incidence of pneumonia in New York during 1884-85.[2]

[1] *Op. cit.*, chap. xv, pp. 285 and 308.
[2] *Op. cit.*, quoted from Sturges, p. 302.

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OBSERVATIONS ON EPIDEMICS OF CHOLERA IN INDIA, WITH SPECIAL REFERENCE TO THEIR IMMEDIATE CONNECTION WITH PILGRIMAGES.

BY CHARLES BANKS, M.D. GLAS.,
Civil Medical Officer, Puri-Jagannath, Orissa, India.

ORISSA has been described as being to India what Jerusalem was to the whole land of Israel. It is the holy land of the Hindus. As the Israelites went up to worship at Mount Zion, so do the inhabitants of the various provinces of India go on pilgrimages to the great temple of Jagannath. The city of Puri, perhaps more familiarly known as "Juggernauth," situated in the south-eastern corner of the Orissa division of Bengal, distant 300 miles from Calcutta, has a population of 28,794 individuals, and an area of 3 square miles. It is the headquarters of a district which has an area of 2,473 square miles, and a population of 944,988 persons, of whom only a comparative few do not profess the Hindu religion.

For many hundreds of years Puri has been the scene of an interminable entrance and exit of religious devotees to worship at the shrine of Jagannath, or take part in the numerous Hindu festivals for which this sacred city is famous, and of which the most important are the Dole Jatra (Swing Festival) in March, the Rath Jatra (Car Festival) in June or July, and the Panchak or five day Festival in October or November.

From its intimate connection with regularly recurring outbreaks of cholera, few Indian cities have received such prominence in medical literature. It has been called a plague-spot, the valley of death, a pest-house whence streams of disease constantly issue, and the ever open grave of throngs of pilgrims. Having been responsible for the health of this vast community during the past two years, a few of my observations on a disease so prevalent amongst the resident and pilgrim populations of the district, and of such universal concern, may not be uninteresting to my former teachers in the University of Glasgow, who are still living, and to others whose privilege it has not been to witness such terrible epidemics as occur during pilgrim assemblies throughout the Indian Empire, and nowhere more frequently than in the town and district of Puri.

It is estimated that during July, 1893, when the Re-incarnation of Jagannath was to have taken place, no less than 200,000 pilgrims assembled, which will give some idea of the

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extent to which overcrowding occurs in the town on such important occasions, not to speak of the halting stations along the whole length of pilgrim routes.

In all such gatherings there is a preponderance of females, which is one of the principal causes of the higher mortality from cholera amongst them than amongst males.

The male community, as a rule, are the more intelligent, and are not so easily induced by pilgrim hunters (who scour the country dilating upon the numerous blessings said to be derived from a pilgrimage to the holy city) to undertake the journey as women are, who readily yield to the pressure brought to bear upon them by this body of wily emissaries, who present to their view a hideous picture of all the torments which will be meted out to them in a future world if they fail to fulfil that condition—a pilgrimage to Puri—which they solemnly affirm, but may not themselves believe, to be essential to the salvation of their souls. On the other hand, women are less able to endure the fatigue and depressing influence of long and tedious marches, and are, notably, more ignorant and regardless of the consequences of disobeying the ordinary laws of health. This constitutes a reason why females are so prone to contract the disease. Amongst no class of native women is disregard for cleanliness in their persons, in eating, and in drinking, more strikingly exemplified than amongst Bengalees, and it is a general belief amongst the inhabitants of Orissa, that cholera of a severe type only appears when such pilgrims are in the majority, and that the disease seldom breaks out or attains serious dimensions amongst up-country people, an opinion to which personal observation warrants me in subscribing. With these few preliminary remarks, I shall proceed to discuss the dissemination of the disease by pilgrims amongst themselves and throughout the district. I shall endeavour to show, from observations during two severe district epidemics in 1894, that the disease was imported, and that during the beginning of the epidemics pilgrims alone were attacked. I shall further show that the disease confined itself to pilgrim routes.

I do not deny that outbreaks of cholera may occur simultaneously, and at a considerable distance from pilgrim routes, but I venture to believe, if it were possible to investigate all such occurrences during pilgrim seasons, it would be found in the great majority of instances that the primary cause was the arrival of pilgrims affected with the disease, or a member of the district community arriving in his native village already suffering, or who had been exposed to the disease prevailing

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amongst pilgrims along pilgrim routes, and attacked on his arrival. In India more difficulty is experienced in arriving at definite conclusions than in almost any other country in the world regarding the progress of epidemics and other points in their history, owing to the very large areas over which civil surgeons exercise medical and sanitary control, and the absolute impossibility on that account of going at once to the place of outbreak in every instance.

I shall first deal with two epidemics during the year 1894.

Epidemic of Cholera during the Rath Jatra (Car Festival) of 1894, from 2nd July to 13th August.—One sporadic case of cholera occurred in the town of Puri during the month of January, 6 cases were reported in February, 12 in March, and 2 in April. One case was reported in May. No cases were reported in June. Pilgrims began to arrive in large numbers, and on 2nd July cholera was reported to have broken out amongst them. From the 2nd to 9th the daily admissions into hospital were 3, 11, 19, 20, 10, 2, 3, and 3 respectively. The disease began to abate. From the 10th to the 28th the admissions were 1, 1, 2, 1, 2, 1, 2, 1, 1, 1, 3, 1, 1, 1, and 2 respectively, only four days being excepted—viz., 13th, 17th, 18th, and 24th, on which dates no cases were received. The epidemic lasted till 13th August. By this time the pilgrims had departed. From the 1st to 13th August the number of cases reported daily by the police were 0, 0, 2, 1, 1, 0, 2, 1, 0, 0, 0, 0, and 2 respectively, which shows that the disease had nearly exhausted itself in the month of July. It was evident, from facts which were observed, that the disease had originated amongst the pilgrims somewhere on their march, and my attention was accordingly directed to the Jagannath Road, along which I proceeded on 3rd July. This road extends in the district of Puri to a distance of something like 43 miles. Satybadi, Pipli, and Baliunta Hospitals are situated 12, 24, and 40 miles respectively from the town. In each of these hospitals, and on the road thither, I saw ample evidence of the dreadful havoc being wrought amongst cholera-stricken pilgrims, and in order to prove that the disease was imported, so far as the town is concerned, the following details are supplied:—

First Group of Imported Cases.—A female pilgrim, aged 23 years, was admitted into Satybadi Field Hospital on 3rd July, suffering from cholera, having been attacked on the previous day. She was accompanied by her mother and brother, who stated that they left home with ten companions fifteen days previously, and joined another batch of pilgrims belonging to Sonamukhi, in the district

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of Bankura. All the other members of this party proceeded to Puri. One of them, a female, aged 30, on her arrival on the evening of 2nd July, was attacked with cholera; a second arrived suffering from it; a third was attacked on 3rd July, who stated that she had diarrhœa on the road, but did not know where; a fourth was attacked on the same day; two were attacked on the 4th. The pandah (pilgrim-hunter) who escorted this company of unfortunate pilgrims, stated that they had passed cholera patients at Haldiapara, Surna, Bhadruck, Baitarni, Nalpur, Tanghi, Telingapet, Bhubeneswar, and Sardaipur, all villages situated on the pilgrim road, leading through the districts of Balasore, Cuttack, and Puri, or, in short, throughout the entire length of the Orissa Division. A connecting link was discovered in the Pipli Hospital, in another female pilgrim, aged 28 years, belonging to the batch of pilgrims with which we have just dealt, who was admitted suffering from cholera on 1st July. She stated that she had been suffering from diarrhœa for two days previously, which means that she was well outside the Puri jurisdiction when she contracted the disease. Presumably she had infected the other members of the company who were attacked on their arrival in Puri, or that they were all exposed to the contagious principle at the same moment. It is important to note in this connection that, according to the Sanitary Commissioner's Bengal Monthly Statistical Report, 35 deaths in the town of Balasore and 882 in the district occurred in June, while 310 were recorded in Cuttack district, through which pilgrims marched. In Puri district, 96 deaths occurred in June, but the disease was confined almost entirely to places not frequented by pilgrims; and I have already said we had no cholera in the town of Puri during the month of June.

Second Group of Cases.—A Hindu female pilgrim, aged 25 years, was found lying on the roadside in a helpless condition, suffering from cholera, and admitted into the Satybadi Field Hospital on 1st July. She was accompanied by a female companion, with whom she left home on 13th June. Not knowing the way to Puri, they joined a batch of forty pilgrims belonging to the district of Manbhum and town of Purulia. One of her company, also a female, died from the disease at Tanghi, in the district of Cuttack. She stated that a male member of the company, belonging to Purulia, and a female, belonging to Manbhum, were left in the hospital at Pipli, both of whom I afterwards saw, and thus verified her statement.

In another case in the Pipli Hospital, there was a history of griping pains in the belly four days previous to the attack, most probably of a choleraic nature, and the beginning of the disease. In yet another case, also a woman, there was a history of illness of four days duration previous to her admission into hospital. The patient stated that she was one of a company of eight pilgrims, and that another female was treated by a Civil Hospital assistant for diarrhœa at Jobra, in Cuttack, and allowed to proceed on her journey.

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Third Group of Cases.—On the day of my proceeding to enquire into this outbreak, I passed, two miles outside of municipal limits, a bullock cart conveying the dead body of a female, who had just succumbed to the disease, having been attacked the previous evening (2nd July). One female, aged 36, belonging to the same company as the deceased, was admitted into the Pipli Hospital on 30th June. A second, age 45, arrived in Puri on the evening of 3rd July, and was attacked during the same night. Two others were attacked on the 4th, early in the morning. It is now more than probable that the high death-rate in Balasore and Cuttack districts during June, from facts elicited in these groups of cases, was composed to a very large extent of deaths amongst pilgrims. It is beyond question that pilgrims conveyed the disease within the jurisdiction of Puri, whatever doubt may exist as to the primary source of infection.

Fourth Group of Cases.—Sadoni, Hindu female, aged 30 years, belonging to Haripur, Dumka, arrived at Puri on 4th July, at 3 P.M. She was attacked with cholera on the same day. Hari Ghar, a male relative of the patient, who was preparing to leave the town when I arrived at the lodging-house in which he was residing, informed me that he and thirty-six other pilgrims went aboard the steamer at Calcutta. When in the canal one of their company, a female, died from cholera, and her dead body was thrown overboard. On being questioned, he said that they had left a female named Mukoda in Pipli hospital, suffering from the disease. As I had previously seen Mukoda, and was directed by her to the lodging-house in which Hari Ghar was living, I felt satisfied that his story was reliable.

Besides numerous other histories of a similar kind, we have one of three persons, who arrived at Puri on the same day, travelled in another infected steamer together, belonged to different companies, lived in different lodging-houses, and were attacked with cholera on the same day and at precisely the same hour. When we know how pilgrims live aboard steamers, it is not so difficult to understand how they pick up the germs of the disease as it is to understand why so many escape them.

First Case amongst Inhabitants of Puri Town.—On 3rd July a male servant of one of the Puri deputy magistrates arrived at Satybadi, having walked alongside a palki all the way from Cuttack, a distance of 41 miles. He remained at this village all night. He took for his evening meal parched rice, and drank the water of the village tank, in which linen, soiled with choleraic dejecta, had been washed. He proceeded to Puri on the morning of the 4th, and was attacked with cholera on the morning of the 5th. After having had three loose stools, he went to the town to witness the Car Festival. He died the same evening. This was the first inhabitant of Puri

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town attacked during the epidemic, and up to the time of his attack, no less than 52 cases had occurred amongst pilgrims. It was late in the epidemic before the inhabitants were affected to any appreciable degree, the disease having in a most definite manner marked out pilgrims as its victims. The history of the case described above goes very far towards making it highly probable that the period of incubation of cholera is considerably under three days. Pilgrims are excluded from Cuttack, which is a cantonment town and military station, and as only one case of cholera occurred therein during the month of June, it is more than probable that the deceased servant was exposed to the disease germs between the 3rd of July, when he left Cuttack, and the forenoon of the 5th, the day after his arrival in Puri. It is almost a certainty that he imbibed the germs at Satybadi, which must have been after 6 P.M., because I saw the palki arrive, and, if so, then the period of incubation in his case did not extend over thirty-eight hours. I considered it advisable to introduce the above remarks on the period of incubation in connection with this particular case, in view of a further reference to the question when I come to deal with other cases, which point to a similar conclusion.

Effect of the Epidemic on the District Population, and the Result of Human Intercommunication.—A robbery of grain took place at a village called Ali Sasan, situated 5 miles from the pilgrim road in the neighbourhood of Pipli. There was no case of cholera in the village at that time. Twelve of the inhabitants, all men, supposed to have been implicated in the theft, were arrested by the police. They were admitted into Puri jail as undertrial prisoners on the evening of 23rd July, having been in police custody from the evening of the 20th. We have every reason to believe they were not exposed to infection or contagion of any kind till their march along the pilgrim route on the 23rd. They were kept apart from the rest of the prisoners, as is customary in Indian jails, and more particularly during epidemics of cholera, under observation. No symptom of the disease manifested itself in any of them while in the jail as undertrial prisoners. On the 25th they were taken to court to give an account of themselves. While in the lock-up, waiting the call of the magistrate, one of them was seized with a desire to defœcate, and was allowed to go out under police escort. I found him soon afterwards in a collapsed state, lying within ten feet of the Cutcherry well surrounded by his dejecta, and deserted by the police and everybody else. He was removed to the cholera hospital,

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where he died the same evening. A servant of the prosecutor in this case, who belonged to the same village, arrived in the town on the morning of the same day, and was attacked with the disease on the evening of the 24th. Artha Mullick, whose name transpired in the evidence, accompanied the prisoners along with the police sub-inspector who had charge of them. He was also attacked with cholera on the evening of the 24th. The movements of the sub-inspector were lost sight of. The remaining eleven accused were received back into jail as convicts under sentence of five months' imprisonment each on the afternoon of the 25th. One of them had two loose stools on his return; a second was attacked with cholera on the following day, 26th, at 7·30 A.M.; a third on the 28th at 10 A.M.; a fourth on the 29th at 8 A.M.; and a fifth, a brother of the fourth, on 1st August. The third died, the others recovered. The further history of these prisoners showed that they had drank water from a dirty tank, much frequented by pilgrims for indiscriminate purposes, on the roadside. This was the first time they had quenched their thirst on the road. It is noteworthy here that the first prisoner was attacked with the disease within forty-one hours after his admission into jail, and, allowing three hours from the time, there is sufficient reason to believe he imbibed the germs, which would enable him to reach Puri, the period of incubation could not have been more than forty-four hours, and in the second case, not more than forty-seven hours; while in the case of the prosecutor's servant who accompanied them, only thirty-three hours had elapsed from the probable time of exposure to the germs. In those three cases, allowing the widest possible margin, it is highly presumable that the incubation period was not more than forty-eight hours. With regard to the other cases, there are so many side issues to the question that no conclusion can be formed on the point under discussion. Probably the fifth prisoner attacked contracted the disease while attending his brother, who was fourth on the list, and that all the others had contaminated each other. Granting, however, that the whole batch (except the fifth) had ingested the germs at the same moment, the longest period of incubation in any of the cases could not have been over 132 hours, which is 156 hours less than the limit fixed by Parkes.

For the following information about epidemics in some district villages, I am indebted to Mr. Hugh M'Pherson, member of the Indian Civil Service, who is sub-divisional officer of the district in which the villages are situated, and

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kindly, at my request, took the trouble to make a personal enquiry into them:—

1. Amir Khan, a Musulman, returned to his native village, after having attended the Car Festival, suffering from cholera. He travelled over 50 miles along the pilgrim road. On his return journey he halted for two days at a village called Ranpur. His wife was next attacked; both recovered. A neighbour was afterwards attacked and died. Cholera also broke out in Ranpur village as the result of his residence there. The disease had not occurred in either of the two villages previously. There were altogether 40 attacks, with 24 deaths, up to the date of these notes.

2. Krushno Jena, aged 40 years, visited Puri during the same festival, accompanied by five companions. One and a half days after his return to his native village called Atiri, 40 miles from Puri, and situated on a pilgrim road, he was attacked with cholera, and died on 6th July, within sixteen hours of his arrival. None of his companions were attacked. Four brothers, living in another house 15 yards distant, were next attacked. One died on the 10th, and another on the 11th. The houses of sixteen other sufferers were all within 100 yards of these cases. The clothes of the first case were reported to have been washed in the backyard of the deceased with water taken from the village well, which means that they were washed after ordinary native village fashion near the mouth of the well, which was flush with the ground. No cholera existed in this village previous to the arrival of the first case mentioned above. Up to the date of taking these notes there had been 23 attacks, with 19 deaths, in the village.

3. Baji Majhi, aged 50 years, attended a marriage ceremony in the village of Atiri, in the house of Mohan Patar, on 6th and 7th July, at the time of Krushno Jena's death. Mohan Patar was one of the four brothers mentioned as having been attacked in the same house in Atiri, and was one of the unfortunate two who died. Baji Majhi was attacked with cholera on his return to his own village on 9th, and died on 10th July. The disease spread, 16 deaths having occurred up to date of enquiry.

4. Nila Barik, aged 30 years, belonging to another village, attended the same marriage ceremony. He was attacked with cholera on his return home on 9th, and died on the 10th July. He complained of abdominal disorder on 8th July. He was the origin of an epidemic in which thirty had been attacked up to the date of investigating the outbreak. Of these, nineteen died, six recovered, and five were still suffering. With one

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exception (the person in whose case an exception is made visited the others) they all lived in adjoining houses, had a common well, and bathing tank in which clothes are washed. In one house no less than ten persons were attacked, of whom eight died and one recovered. One was still suffering.

In this series of cases we have examples of the dreadful results of human intercommunication during epidemics of cholera, the first cases being clearly traceable to the epidemic under report during the Car Festival. It is noteworthy that, on the days of the marriage ceremony (6th and 7th July), cholera *actually* existed in the house in which the ceremony was held. The disease did not exist in the village till the 6th. The period of incubation could not, therefore, allowing for all possible contingencies, have been over twenty-four hours in the first cases. Nila Barik had abdominal disorder on the 8th. Baji Majhi was attacked on his return home on the 9th. In both those cases the presumption is that the period was well within forty-eight hours. I regret that the precise hour of attack could not be ascertained. Further information on this point could not have lengthened the period, but might have reduced it. All the above cases appear to point to the water supply as the principal vehicle in the dissemination of the disease germs, and as I have the history of another village epidemic which I investigated, and which also supports the "water-borne" theory, and gives another illustration of the effects of human intercommunication, I may just as well give the details of it.

Baji Mullik arrived at his home, in a village called Sewla, which has a population of 300 individuals, suffering from cholera, having been attacked on the road. He carried with him some soiled linen which were washed in a small tank at the end of his house. Four yards from the doorstep was a shallow unprotected well from which their own and their neighbour's domestic supply was obtained. There is hardly the shadow of a doubt that this well was contaminated. In fact to avoid it was an utter impossibility. Four other members of the family, to which the first person belonged, were attacked. One was attacked in the neighbouring house. In a third house three were attacked and all died. In a fourth three were attacked of whom one recovered. The father of the third family attacked attended the first case, giving him milk and otherwise nursing him, but was not attacked himself. The first two families used the same well. The fourth had abandoned the use of their own private well, the water of which they said was bad, and derived their supply from

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a well in the neighbourhood of the first three affected houses, situated about 200 yards off. Eighteen persons were attacked, of whom fourteen died before the epidemic exhausted itself.

Geographical Distribution of the Disease during the Epidemic, showing how exclusively the Disease confined itself to Pilgrim Routes.—Bhubeneswar Temple, situated two miles off the direct pilgrim route, practically on the boundary line betwixt the Cuttack and Puri districts near Baliunta, is almost as important to pilgrims as the Temple of Jagannath, the great majority of whom visit it either going to or returning from Puri. There were no deaths from cholera at Bhubeneswar during the months of May and June. Directly the pilgrims began to arrive cholera broke out in the neighbouring villages, the inhabitants of which frequently visit Bhubeneswar. Out of 178 deaths from cholera in Khurda subdivision, which includes Bhubeneswar, 177 occurred in that portion of it which is frequented by pilgrims.

In the Banpur circle of the district, which is practically cut off from pilgrim communication, and whose population is 94,949, and which has an area of 360 square miles, no deaths occurred during July, and only two in August. In Gope circle, with an area of 337 square miles and a population of 134,308 souls, situated outside the area of pilgrim traffic, and in which the roads are rendered almost impassable owing to floods at this season of the year, only eleven deaths occurred in July and thirteen in August.

In the town of Puri, Puri Sadar circle, Pipli, and Khurda, much under pilgrim influence, a very different result was shown.

In the town, 109 deaths occurred during the epidemic, of which 75 were amongst pilgrims.

In Puri Sadar circle, with an area of 865 square miles and a population of 209,273 persons, out of a total of 517 deaths during the year 1894, only 31 did not occur during pilgrim seasons; 169 occurred during the Car Festival. And in a second epidemic, which I shall deal with later on, and which occurred simultaneously with the arrival of pilgrims for another festival, 62 deaths from cholera were reported in this circle.

In Pipli circle, with an area of 325 square miles, and a population of 241,470 persons, out of 715 deaths from cholera during the year 1894, 211 occurred during the Car Festival months, and 144 in the second epidemic. Only 79 deaths did not occur during pilgrim seasons.

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In Khurda circle, with an area of 583 square miles, and a population of 234,730 people, through which a pilgrim route to the Central Provinces passes, and in which Bhubeneswar is situated, out of 334 deaths from cholera during the year, 180 occurred during the Car Festival. Only 24 did not occur during pilgrim seasons.

A reference to the experience of the preceding year (1893), which was a highly auspicious one for pilgrimage, and when, as we have already mentioned, 200,000 pilgrims attended the Car Festival, still more conclusively demonstrates the intimate relationship which exists between pilgrim seasons and epidemics of cholera.

In 1893, out of 271 deaths in Puri town from this disease, 245 occurred in July and August. In Puri Sadar circle, 310 out of 522 deaths; in Pipli circle, 333 out of 610; in Khurda circle, 98 out of 163; while in Gope circle only 8 out of 183, and in Banpur circle 8 out of 12 deaths, during the year, occurred in July and August. In the last mentioned circle only 2 occurred in July. It will be noticed that Gope and Banpur, which are not subjected to pilgrim influence, shew a very small death-rate from cholera during July and August compared with the other circles.

Second Epidemic of Cholera, from 6th October to 28th November, 1894, occurring in the town of Puri simultaneously with the arrival of Pilgrims.

Importation of the Disease.—The first epidemic ceased on 13th August. The town was thereafter free from the disease till the month of October, in the early part of which I left to make the quarterly inspection of Pipli and Baliunta dispensaries. No sign of cholera was seen anywhere on the road, which was swarming with pilgrims proceeding to Puri. On the morning of the 4th October I reached Baliunta, when I was informed by the Civil Hospital assistant in charge of the hospital that the last of three pilgrims admitted suffering from cholera had just died. The other members of the company to which these three belonged must have passed me on the road. On the 7th October I received a telegram from the assistant health officer informing me that cholera had broken out in the town on the 6th, and that ten patients, all pilgrims, belonging chiefly to the district of Midnapore, had been admitted into hospital. The daily admissions were as given in the following statement:—

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October,	6	7	8	11	12	13	16	19	22	23	24	26	27	28	29	31
Admissions,	5	7	1	3	2	3	3	2	2	2	1	1	3	7	3	2

November,	2	3	6	9	11	12	13	14	15	16	17	20
Admissions,	1	1	2	4	5	6	6	4	2	1	1	1

During this epidemic 135 cases were reported by the police, with 101 deaths, including all the deaths in the hospital.

The following histories of cases during this epidemic are given to show the connection with the first cases admitted into Baliunta Dispensary. They at the same time prove that the disease was again imported into the town by the pilgrims:—

1. Podi, Hindu female, aged 50 years, was one of a batch of forty-one pilgrims who left home fifteen days previously. She arrived at Puri on the night of the 5th October, and was attacked with cholera on the 6th at 6 A.M. A pilgrim belonging to another company with whom they mixed was attacked with cholera near Baliunta.

2. Orui Bewa, Hindu female, aged 50 years, left home thirteen days previously, and arrived at Puri on the evening of 5th October. She was attacked with cholera on the 6th at 7 A.M. She belonged to a party consisting of thirty-two pilgrims. She stated that one of the party whose name she did not know, but who was known as Ram Barik's mother, was left behind at Pipli Hospital suffering from the same disease.

3. Audika, Hindu female, aged 30 years, living in the same lodging-house as No. 2, has precisely the same history.

4. Moti, Hindu female, aged 80 years, has the same history as Nos. 2 and 3.

5. Kusto Sahu, Hindu female, aged 50 years, left her home one month before in company with twenty other pilgrims. They obtained their water-supply from wells, roadside tanks, ditches, and pools. They passed two cholera patients, both pilgrims, lying on the road near Puri. She arrived on the evening of the 4th October, and was attacked during the night of the 6th.

6. Pari, Hindu female, aged 24 years, was found dead near a sacred tank at the entrance to the town. As a heavy shower of rain was falling, she was left to her fate under a tree on the roadside, four miles from Puri, but managed to reach the tank before expiring. Her husband, who was accidentally discovered, made the above confession, and acknowledged that the deceased person was his wife.

7. Sunder Sino, Hindu male, aged 35 years, left his home fifteen days before in company with twenty-two other pilgrims. They marched 10 or 15 miles daily. He arrived at Puri at 11 A.M. on 5th October, and was attacked with cholera during the night of the 6th.

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One of the party was attacked at the Baitarni river, near Jajpur, in the district of Cuttack; and, as they left him behind, it was unknown and of no interest to them whether he recovered or died.

If it were necessary to cite more cases to prove importation into the town and even into the district, the many that could be added would, in a no less decided or definite manner, prove the correctness of our argument and show conclusively that pilgrimages and cholera are almost inseparably related to each other, and that when epidemics do not occur during pilgrim seasons the fortunate and happy result must be ascribed to phenomena, atmospheric, telluric, or other, about which we have still much to learn.

Two Points of Special Interest in Connection with the Second Epidemic.—(1) The epidemic somewhat abated from 16th to 21st October, when it again took on violent action. The steamer *Balaram* arrived at Cuttack early on the morning of the 18th, crowded with pilgrims bound for Puri. Two cases of cholera occurred on board on the 17th, and a third on the morning of the 18th. One of them died. The other two were landed alive. One of them was afterwards found dying on the roadside, four miles along the road from Cuttack to Puri. The other pilgrims proceeded on their journey with the result that, on their arrival, the disease assumed greater severity, the police reporting no less than thirty-eight fresh cases up to the end of the month. It will be noticed from the statement previously given that on the 28th, the date of the Kali Pujah, there were seven admissions.

(2) There was a lull in the epidemic afterwards, the cases admitted to hospital being on the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, and 8th November, 0, 1, 1, 0, 0, 2, 0, and 0 respectively. The first day of the Panchak Festival occurred on the 9th November, and the number of pilgrims again increased. From this date till the 13th, the last day of this festival, the number of admissions were 4, 0, 5, and 6; and from the 14th to the 20th, 4, 2, 1, 1, 0, 0, and 1 respectively. No cases were admitted after that to the hospital, but the police reported from the 21st to the 28th, the date on which the epidemic ceased, 1, 0, 0, 0, 0, 0, 1, and 2 respectively. No cholera occurred in the town during the rest of the year, but a death *supposed* to have been due to the disease was reported by the police on 5th December. There is a belief amongst Hindus that residence in this holy town during the month of Kartik (October or November) increases their sanctity. During

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this month most of the residents fast the whole day, and take mohaprasad (rice cooked in the temple of Jagannath) at night only. The last five days of the month of Kartik constitute the Panchâk or five day festival, and it is very striking that the epidemic increased in intensity during this period.

(*To be continued in next Public Health Section.*)

CEYLON AS A WINTER RESORT.

By P. M. SHORT, Talawakele, Ceylon.[1]

THE island of Ceylon, immortalised by Heber in his missionary hymn as "the isle of spicy breezes," will ere long establish for itself a name as the most delightful health and winter resort in the world. It is only within the last three or four years that its value as such has begun to attract the attention of the general public and also the medical profession. The Germans have not been slow to make use of Ceylon as a resort during the winter months. Every year the numbers of visitors from Surinam are increasing.

Unlike the continental resorts, there is no severe weather experienced in the shape of frost and snow within the verdant shores of Ceylon. The variety of climates in Ceylon is what makes it so popular as a health resort. For all forms of disease requiring a change of climate, Ceylon affords a wider field than any other country. For the consumptive, the dry bracing air of the Uva country, and also of Jaffna, affords the most salubrious habitat that could be desired; the bronchitic will find Kandy admirably adapted to spend the winter in; while any one suffering from neurotic affections will find the Sanatorium of Ceylon—viz., Newera Eliya—with its fine bracing atmosphere and cheerful surroundings, everything that could be desired.

The journey from England is a most pleasant one when undertaken between the end of September and beginning of December. The floating palaces of the P. and O. and Orient lines of steamers make one feel inclined to say, as he sees the haven for which he is bound springing up in the horizon, "Oh for a constant job as a passenger on these wave-tossed homes!" The journey is accomplished from the London docks in about twenty-one days, or, if it is desired, the Overland route can be taken, which is about two or three days less.

[1] Formerly a student of medicine in the University of Glasgow.

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For one in search of health, the more advisable route is the direct one, the voyage, indeed, being as beneficial in many instances as the change of climate. The variety of scenery that is unfolded during the voyage has a wonderful effect on many, by drawing their attention away from their pains and aches. In this respect Ceylon is without an equal. The passenger by train is every few minutes transported to fresh scenes, which one moment are rugged, the next most sublime. The Ceylon Railway carries one through a most perfect panorama of scenery.

It would be well here to give a synopsis of the best method of procedure after landing in Colombo, the capital of the island. There are three first-class hotels—the Bristol, the Galle Face, and Grand Oriental—in Colombo. The Bristol is most replete in accommodation, everything being done on the most modern plan. It is roomy, well ventilated, and the sanitary arrangements are most perfect. To one wishing to spend a few days in the capital no better place could be got than the Bristol. There is not much of interest in Colombo, although the drives are very nice round about. The hot, moist air of Colombo is very relaxing, and for a weakly person the Grand Hotel, at Mount Lavinia, about seven miles from Colombo, is the place that should be chosen for a rest after the long sea voyage. Mr. Link, the genial manager, is most attentive, and sees well to the comforts of his visitors. The hotel is situated on a fine promontory, and is cool, and, best of all, free from mosquitos. There is fine sea-bathing to be had. The following is the meteorological report for Colombo for an average of about twenty years:—Lat. N. 6° 56′; long. E. 79° 51′; elevation, 40 feet above sea; mean temperature, 80·6°; rainfall, 88·29 in.

After resting for a few days, it is advisable to make tracks for the hills. As the journey is a long one, it is best done in easy stages. The station is quite convenient to Mount Lavinia, and tickets ought to be taken for Kandy. The journey occupies about five hours, and the scenery is very fine. The principal hotel in Kandy is the Queen's, most delightfully situated on the side of the lake. Another hotel is proposed to be built, in order to meet the demand for accommodation; but the site is not all that could be desired.

The town of Kandy is very historical, being the seat of the Kandyan kings. It is one of the most picturesque towns in the East, nestling, as it does, between high hills on either side, and a beautiful sparkling lake in the centre of it. It has a famous temple, in which is stored Buddha's wisdom tooth!

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To one suffering from bronchial affections, Kandy is most admirably adapted. It lies in lat. N. 7° 18′; long. E. 80° 40′; elevation, 1,700 feet. The average mean temperature for the year is about 75·3°; the annual rainfall, 81·31 in.

The medical profession is well represented by an old colonist, Dr. V. Duke, besides native practitioners.

From Kandy, the next stage of the journey should be Hatton, a place famed for nothing in particular save the venerated peak, 14 miles distant. This peak is called Adam's Peak; on the top of it is a footprint of Buddha's, where he landed on doing a hop, step, and jump from India. There is a comfortable hotel at Hatton called after the peak, where a night can be spent comfortably and the journey renewed afresh next day for Newera Eliya, the great sanatorium of the East. The station at which the journey is broken is about two hours from Hatton. From the station the coach has to be taken to Newera Eliya—the City of the Plain. The principal hotel here is the Grand, but there are several first-class boarding houses. During the season it is very lively and gay. The situation is delightful, resting at the foot of Pidurutalagala, the highest mountain in Ceylon, with a broad expanse of verdant plains dotted all over with rhododendrons. It is most admirably suited for carrying out "Oertel's" treatment in cases of functional disorders of the heart, also for nervous affections; the air being bracing and the altitude about 7,000 feet. The average mean temperature is 57·7°; rainfall, about 96 in. Every facility in the shape of recreation can be had here—golf, tennis, polo, fishing (trout), and for the sportsman, the elk plains close by afford ample game of all sorts, from hares to elephants. Newera Eliya might well be called the Davos Platz of the East—in fact it has been called the Riviera of the East by Indian, China, and Straits Settlement visitors. But the Riviera is better applied to a newly opened-up country—the Uva district. The terminus of the railway is here at a place called Bandarawella. This will in a very short time be one of the finest health resorts in the world; the climate is almost perfect, there being little variation in temperature night and day—in fact, one could sleep outside at night without fear of cold or anything. The accommodation at present is very limited; but ere long a fine hotel will rear its head, and great improvements will be wrought in order to make it attractive. Without doubt it will bid fair as a rival to Denver, and other such places. It is about 4000 or 5000 feet above sea level; average mean temperature, 70°; rainfall, about 81 in.

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Of the other resorts, Jaffna, in the north, is famed for consumptives; Galle, in the south, for asthma. If it was necessary, numerous instances could be given of the marvellous effect the climate of Ceylon has on phthisis and other affections. The writer himself can testify to its beneficial influence in laryngeal cases, being himself a sufferer. There is a most remarkable case on record of a lady who was given up as hopeless by the leading physicians at home. She was brought out here and had to be carried off the ship in a litter. After a few months she recovered, and in time got married, becoming the mother of a large family.

The cost of living is very moderate. The first-class hotels will board a person for about £10 sterling a month, while boarders are taken in by private individuals for a great deal less than that.

Carriage hire is also very moderate, costing about 6s. per day for a carriage drawn by horse; while the Rickshaw, or one man power carriage, can be had for about 2s.

In regard to clothing, it is better to take sufficient for the voyage only, as clothes suitable for the climate can be had cheaper and better made there than at home.

The following are the principal private practitioners—*i. e.*, European:—Drs. Murray, Perry, A.M.S., Fairlie, and Park, in Colombo; Dr. Duke, Kandy; Dr. Craib, Newera Eliya; Dr. R. J. Drummond, Talawakele; Dr. Renny, Hatton. There are also any number of native practitioners.

The principal hotels are:—Bristol, Grand Oriental, and Galle Face, in Colombo; Grand, Mount Lavinia; Queen's, Kandy; Adams' Peak, Hatton; Grand, Newera Eliya; Rest House, Bandarawella.

CURRENT TOPICS.

QUEEN MARGARET COLLEGE ANATOMICAL DEPARTMENT.—The formal opening of the new building, the gift of the Bellahouston Trustees, to be devoted to the teaching of anatomy and physiology in Queen Margaret College, took place on the afternoon of Monday, 18th November last, at 4 o'clock. Principal Caird presided, and amongst those present we noted Professors Gairdner, Buchanan, Robertson, Lodge, Coats, M'Call Anderson, M'Kendrick, Cameron, Ferguson, Bower,

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Jack, Charteris, and Young; Sheriff Berry; the Lord Provost, Sir James Bell, Bart.; the Lord Dean of Guild, Hugh Brown, Esq., Sir W. Renny Watson, the President of the Faculty of Physicians and Surgeons, Dr. Bruce Goff, Mrs. Elder, Miss Galloway, Mr. Mitchell; Drs. Bryce, M'Vail, Wood Smith, Knox, Walker Downie, M'Gregor Robertson, Wallace Anderson, Pringle, Luke, Lindsay Steven, T. K. Dalziel, George B. Buchanan, Snodgrass, Marion Gilchrist, Elizabeth Lyness, Louisa Cuming, and Margaret C. Dewar.

The Principal, in declaring the building open, expressed the gratitude of the University to the Bellahouston Trustees for their generous gift, and congratulated the members of teaching staff of the College, especially Professor M'Kendrick and Dr. Bryce, upon the successful completion of the building. He could not speak from the point of view of an expert, but would leave a description of the details to Dr. Bryce. He might say, however, that all competent to judge would be ready to admit that the building was admirably suited for the purpose for which it was intended, and that it formed a fitting addition to the main building, for which the University was indebted to Mrs. Elder.

The history of Queen Margaret College was one of growing prosperity. From Miss Galloway he had received the following outline of its career. The Medical Department of the College originated in the request of a number of ladies, in 1889, for facilities for the medical teaching of women. By the kindness of Mrs. Elder the Council was able to comply with the request. With the help of the medical Professors, and especially of Professor Young, the first Dean of the School, the medical department was opened in 1889, with 13 medical students—there were now 67 medical students enrolled. The total number of students in the College, including the medical, in 1889-90, was 194, now there were 232 students matriculated. For the first two years only the triple qualification was open to the students, but in 1892 the medical degrees of the University were thrown open to them, and most of them took their examinations over again for the purpose of graduating. In the winter of 1894 Miss Marion Gilchrist and Miss Alice Louisa Cuming graduated M.B., C.M., and were thus the first women medical graduates in Scotland. Some of the graduates were now engaged in practice, five were in India, one in Egypt, and two were ready to go to China, when the political affairs of that country were in a more settled condition. The facilities for medical teaching were good from the first. A new chemical laboratory had been opened in 1888, and for

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clinical and dispensary instruction ample accommodation had been provided in the Royal Infirmary and other Hospitals in the city. The teaching of anatomy had at first to struggle against very defective accommodation, but that defect had now been removed by the gift of the Bellahouston Trustees. These facts were very encouraging to all having the welfare of the Institution at heart. The prejudices against the medical education of women had now in large measure been overcome. Even those ready to be prophets of failure at first would now probably admit that they had been false prophets. To this result the success of the Queen Margaret College Medical School had largely contributed. Whether we regard the College as to the quality of its teaching, or as to its accommodation for practical work, or as to the number and diligence of its students, Queen Margaret College might now be regarded as one of the first, if not the very first, Medical Schools for women in the country.

Dr. Bryce, lecturer on anatomy, then gave a short account of the building, and proposed a vote of thanks to Messrs. Honeyman and Keppie, the architects.

A vote of thanks to the Principal, moved by Sir W. Renny Watson, terminated the formal business of the meeting, after which the visitors inspected the various parts of the building.

REVIEWS.

An Anatomical Dissertation upon the Movement of the Heart and Blood in Animals, being a Statement of the Discovery of the Circulation of the Blood. By Wm. Harvey, M.D., Physician-Extraordinary to King James the First; Physician-in-Ordinary to King Charles the First; and Professor of Anatomy in the Royal College of Physicians in London. Privately reproduced in Facsimile from the Original Edition printed at Franckfort-on-the-Maine in the year 1628, with a Translation and Memoir, for G. Moreton, 42 Burgate St., Canterbury, 1895.

We regret that pressure of other matters has prevented us earlier taking notice of this very beautiful facsimile reproductions of Harvey's great work. In addition to the reproduction of the "exercitatio," the volume contains an interesting

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and concise account of the life of Harvey, and an English translation of the Latin original. Harvey's work, which extends only to 74 quarto pages in all, is dedicated to King Charles the First, and "to his very dear friend, Doctor Argent, the excellent and accomplished president of the Royal College of Physicians, to other learned physicians, his most esteemed colleagues." It may interest our readers to have the precise title of the book, which is as follows:—

EXERCITATIO
ANATOMICA DE
MOTU CORDIS ET SAN-
GUINIS IN ANIMALI-
BUS,
GUILIELMI HARVEI ANGLI,
MEDICI REGII, & PROFESSORIS ANATOMIAE IN COL-
LEGIO MEDICORUM LONDINENSI.

FRANCOFURTI,
SUMPTIBUS GUILIELMI FITZERI.

ANNO M. DC. XXVIII.

The present reprint is bound in half vellum and buckram, and, both as a valuable memento and an artistic production, is worthy of a place in the collection of all lovers of good books.

Annual Report of the Department of Health of the City of Chicago for the year ended 31st December, 1894. By ARTHUR H. REYNOLDS, M.D., Chicago. 1895.

THIS is a lengthy report, and really consists of a series of reports drawn up by the chiefs of the various bureaux or divisions of the department. The report opens with some general remarks by the Commissioner of Health, Dr. Reynolds, in which he draws attention to the low death-rate of the city for the past year—viz., 15·24 per 1,000. Certainly such a low death-rate is very satisfactory; but it must be remembered that Chicago is quite a modern city, with new houses, new buildings, wide streets, fine and extensive squares. That being so, every other sanitary arrangement should be as

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nearly perfect as possible. Given such a state of things, a low death-rate ought to be the result.

Dr. Reynolds goes on to show that certain diseases are diminishing, notably those which are affected by improved sanitation, while others are on the increase. Among the latter is cholera infantum. Children fed at the breast are remarkably free from this disease; but no reference is made to this in the report, nor as to whether this method or that of hand-feeding generally obtains within the city.

Chicago obtains its water supply from the lake. Typhoid fever appears to have been very prevalent in the city since 1861, which is not to be wondered at in consequence of its water supply having been so liable to sewage pollution.

The year 1890 was remarkable for two things: firstly, a sudden increase in population of over 270,000; and, secondly, a sudden increase in the death-rate from typhoid fever, which continued during the following two years. This increase in population meant the discharge of a larger volume of sewage into the lake and a more serious pollution of its waters in the neighbourhood of the intakes. In December, 1892, a new tunnel and fresh intake, four miles out into the lake, was completed, with the result that the typhoid death-rate diminished, and last year it reached a point the lowest on record since 1851. But can the water supply even now be considered absolutely satisfactory? Will not the continual discharge of sewage into the lake, taking into account also the possibility of a further large increase in population, cause the pollution to increase, and extend even to the four-mile intake? The quality of the water supply is kept under observation; samples are taken weekly and subjected to analysis. The methods adopted are fully described. They are good, and comprise such features as are of value in determining the drinking quality of the water. The number of bacteria present in each sample is also estimated, which is a very necessary procedure, as no analysis of drinking water can now be considered complete without such examination.

The analyses show considerable variations in the results obtained. This (as is pointed out in the report) is doubtless due to the changes in the flow of sewage into the lake.

Taking the results as a whole, the water can only be placed in the class of usable waters. The number of bacteria present, according to the estimations given upon several occasions, reached the suspicious point; but the nature of the bacteria is more important even than the number where serious contamination is possible. We consider a public

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water supply cannot be absolutely safe unless it be derived from a source entirely removed from the possibility of all serious pollution.

The registration of births and deaths appears to be defective. To this Dr. Reynolds draws attention, and offers practical suggestions for its improvement.

We gather from the report that the notification of infectious diseases is in an unsatisfactory state. The Commissioner seems to incline to the opinion that the householder should be required to make the report; but we consider the so-called dual system, as enforced by the English Act, the more preferable. Notification is compulsory under the municipal code of Chicago, but, owing to opposition, appears not to be strictly enforced. Typhoid fever does not appear to have been notified, for the report contains no information relative thereto. This is an important omission, since that disease has been so prevalent in the city. The only diseases notified, according to the tables in the report, are small-pox, scarlet fever, and diphtheria.

The statistical tables are elaborate, and have been carefully prepared.

The Report of the Division of Contagious Diseases deals very fully with the epidemic of small-pox which prevailed in the city last year. Consisting, as it does, of a series of reports by the various medical inspectors, some of the information contained therein is more or less repeated; but, taking these reports as a whole, they give a very exhaustive history of the epidemic, together with an elaborate and detailed account of the various methods resorted to in dealing therewith.

Small-pox gained a footing in the city in the latter end of 1893. Vaccination had been seriously neglected, and in the early months of 1894 the disease had assumed a serious epidemic form. That the city was unprepared for the epidemic owing to many years neglected vaccination had been foreseen by the Commissioner. Wholesale vaccination was decided upon, but it was not until April, 1894, that an adequate supply of lymph was available, or authority for its purchase, and for the employment of the necessary force of vaccinators was obtained. By the end of June nearly 1,000,000 vaccinations had been performed.

There were 2,332 cases out of a total of 3,076 removed to hospital for treatment, of which the mortality of the vaccinated was 16·21, and of the unvaccinated 36·22 per cent. No information, however, is given as to the efficiency with which

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the operation had been performed or otherwise, nor does the report state the number which had been revaccinated. On looking through the detailed tabular statement of these cases, however, we find that 117 are stated to have been revaccinated, of which 6 died. It appears probable from the table that two of these cases had been revaccinated after exposure to infection. If that were the case, on deducting them there were 115 revaccinations with 4 deaths, which gives a mortality of 3·9 per cent among those stated to have been revaccinated. These figures are further proof of the value of vaccination as a preventative of small-pox. The health officers had a truly herculean task to perform in dealing with this epidemic, and these reports bear evidence of work carried out with a determination, tact, perseverance, and zeal which a sense of public duty alone could inspire.

The Report of the Municipal Laboratory shows that the milk supplied to the city is kept under careful supervision. Over 12,000 samples were taken during the year for analysis. The standard of quality and purity required is good, and the methods of analysis applied in the examination thereof are ample, and calculated to give correct results. The regulations in force require all skimmed milk to be tagged as such, and the use of brewery grain as a food for milch cows is prohibited. The latter is a very good provision, as such feeding very much deteriorates the quality of the milk.

Arrangements have been made for the bacteriological examination of the throat secretion in suspected cases of diphtheria, and the preparation of antitoxin for the treatment of that disease. The analyses of milk and water appear to include most of the work done in the laboratory, for less than seventy samples of food stuffs other than these were analysed during the year. This is a small number for a city of the magnitude of Chicago, consequently the supervision exercised over the food supplies of the city is not so efficient as it might be.

The system of meat inspection, however, is complete, and is rigidly carried out at the slaughter-houses, which is the proper place for making the inspection.

The Report of the Bureau of Sanitary Inspection partakes the form of an address on sanitation to the citizens of Chicago, and all the information it contains of work done is a tabulated list of inspections made, notices served, plans examined, &c., during the year.

The Report of the Bureau of Smoke Inspection deals with the causes of the nuisance in a clear and scientific manner,

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and contains useful suggestions as to the best manner of dealing with the nuisance.

The Free Public Bath is a valuable institution; is equipped and managed in an excellent manner; and is well patronised, especially by the working classes.

Information upon several subjects of interest, and which would have increased the value of the report, might have been included. Without attempting to enumerate these omissions, we may mention that nothing is said as to the general character of the city and its surroundings, nor as to the geology of the district, the extent, construction, and condition of the sewers and drains, nor the ventilation and flushing of the same. The meteorological information given is also meagre.

But the report on many points is detailed and exhaustive, and has been carefully prepared. It contains a large amount of useful information, and bears evidence of good work done during the year under a department which is thoroughly well organised.

Hygiene and Public Health. By LOUIS C. PARKES. Fourth Edition. London: H. K. Lewis. 1895.

THIS manual continues to maintain its hold as a text-book for students of hygiene, as is proved by a fourth edition being called for within six years of its original publication. As a compendious treatise it meets the student's need, and satisfies his desire for a general knowledge of the subject. It does not profess to do more than summarise the important points of the wide-ranging area of State medicine, and consequently, when the student wishes to make a more exhaustive study of any particular subject, he must perforce draw from the larger treatises or from monographs. This edition differs almost in nothing from the original, which was reviewed in vol. xxxiv of this *Journal*, p. 133 *et seq.* Perhaps the only noticeable feature is the necessary emendations and amplifications consequent upon advancing knowledge.

Containing, as it does, about eighty illustrations, which, upon the whole, give point to the text, the student so far receives a periodic demonstration as his reading progresses. The chapter on the collection, storage, composition, and analysis of water remains, to all intents and purposes, as in the original edition. Regarding the analytical examination, we are of opinion that it is too sketchily treated, and deserves fuller treatment at the hands of the author. For example, in detecting the presence of iron, lead or copper, the author,

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while giving the student the necessary information how to differentiate between the two former metals, fails entirely to do so respecting the two latter. It is perfectly true that the presence of either would be sufficient to condemn a water for domestic use; but at the same time it might be of importance, apart from the mere precise knowledge, to ascertain which of these two metals was the contaminator. So also, in dealing with the estimation of the temporary and permanent hardness of a water, the author fails to inform the student that after the water has been boiled to deprive it of its temporary hardness, it should be filtered of the precipitated $CaCO_3$ before the soap test is again used. The biological examination of water is, in like manner, discussed in a couple of pages.

In the chapter dealing with the disposal of excretal and other refuse, we observe that the author, in his proper condemnation of the pan closet, still adheres to the statement that the trap leading from it is usually a D-trap. Whatever may obtain in London and England generally, it is certainly not true of the principal towns of Scotland, and of Glasgow in particular. The trap commonly met with in this city, where that form of closet still largely exists, is the S-trap, which is not so objectionable as the more ancient form.

Too little prominence is given to the most satisfactory manner of applying the smoke test, and here, too, is felt the want of a suitable illustration.

The chapter on Air and Ventilation is very fully treated, but in dealing with Pettenkofer's method of estimating CO_2 in air, the author says nothing of Pettenkofer's tubes, through which the air in minute bubbles is permitted to pass through the contained solution of standard baryta. The plan which he gives—by using a large glass jar—is by no means so likely to give, in the hands of a careless or an inexpert manipulator, such correct results as do the tubes. Neither, in estimating organic matter, does the author even mention Carnelly's process by name.

The chapters on Warming and Lighting, on Climate and Meteorology, on Soils and Building Sites, on Food, Beverages, and Condiments, although necessarily much condensed, are well up to date.

More attention has been given to the chapter on Contagia, and in connection with the different zymotic diseases, which are individually treated in a succinct manner, the author has tried to give the latest results of bacteriological research; but while he discusses the intimate nature of contagia, he fails to say enough regarding immunisation; and, in speaking of

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glanders, he does not mention the antitoxin-mallein, which is now being largely used in veterinary practice.

The author, recognising the importance of a true knowledge of the natural history of the contagium of small-pox, adduces well-known evidence to prove that, in the absence of certain restrictions as to vicinage, a small-pox hospital is a grave source of danger to neighbouring population. We are pleased to see that he adopts this view, especially since some efforts have been recently made to break it down. The author, in view of the present determined attacks against vaccination from several quarters, might, profitably to his readers, have expended more pains regarding the value, efficacy, and dangers, so-called, of vaccination; for it is but too true that, while the medical profession generally believes in vaccination as a protector against, or at least as a modifying factor in, small-pox, and practises accordingly, too little attention has been paid, in the education of the medical student, to that subject. Hence it not infrequently happens that, when he becomes a practitioner, and, perchance, is confronted by an ardent anti-vaccinationist, he finds himself utterly incompetent to defend his practice, much less to act on the aggressive.

Dr. Parkes dismisses the subject of the antitoxin serum of diphtheria in less than a dozen and a-half lines, and he leads his reader to understand that after the horse has been fully prepared, so that the serum of its blood possesses high antitoxic properties, it may then be bled, the serum be separated from the clot and stored, and that then it is ready for use. Dr. Parkes omits to mention a very important thing which must be done with it before it can be used in the human subject—viz., a knowledge of its exact potency by standardising against guinea-pigs. The remainder of the chapter, which deals with the prevention of communicable diseases, and hospitals, is very satisfactorily treated. The volume concludes with a chapter on Statistical Inquiries.

Notwithstanding the above-noted omissions, the book deserves well of the student of hygiene, for in it he will find safe guidance and carefully arranged instruction.

Transactions of the New York Academy of Medicine for 1893. Second Series. Vol. X. Printed for the Academy. New York: Stettiner, Lembert & Co. 1894.

THIS volume contains a selection of the papers read at the meetings of the New York Academy of Medicine in 1893, and

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also reports of the discussions following them. The papers are very varied in character, and the subjects are from all departments of medicine and surgery.

There are four papers on Obstetrics and Gynæcology. The first is on a "New Method of Artificial Respiration in Asphyxia Neonatorum," and is interesting as giving us a good method to be used as an alternative to that of Sylvester. The author claims to produce, with his method, the same effect on the cavity of the throat, and therefore on the lungs and circulation, as Schultze does with his, but without the violent swinging movements which make the latter so objectionable in some cases. Dr. Currier, in his paper on "Myoma of the Uterus," advocates early operative interference, even in cases where there are no symptoms: "the moment such a tumour is recognised, the moment has come to interfere." Few British gynæcologists, we think, would agree with him in this opinion, the feeling in this country still being that a fibroid tumour which gives rise to no symptoms should be let alone, and that the risks of an hysterectomy are not to be lightly undertaken. The latter half of the paper is taken up with a discussion of the various methods of performing hysterectomy, that advocated by Dr. Currier being a total extirpation of the uterus with the cervix and appendages. There is also a "Discussion on the Application of Symphyseotomy at this Era," from which it would appear that that operation has made more way in America than it has yet done in this country.

In the department of pure medicine there is a very interesting paper on the "Diagnosis and Treatment of Pleurisy," by Dr. Beverley Robinson. He deals with the cases in which the signs on which one would naturally rely for diagnosis are either absent or misleading, and yet pleuritic effusion is undoubtedly present. The conclusion to which he has been brought is that "authorities are occasionally inaccurate."

The only contribution to the literature of Diseases of Children is a paper by Dr. Judson on "The Importance of Early Attention to the Disability Caused by Infantile Paralysis." He strongly advises the early use of mechanical supports, splints, braces, &c.; and in order that these should be properly prescribed and applied, he insists that these cases should be early handed over to the orthopædic surgeon. A strong protest was raised, in the course of the discussion, on behalf of the general practitioner, who had received very rough treatment at the hands of Dr. Judson.

There is also an interesting paper by Dr. Murphy, of Chicago, on the subject of "Intestinal Approximation." He

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gives a pathological report of the three specimens of small intestine which had been operated on, and united by means of his button. The *first* was examined on the fourth day after operation, the *second* on the thirtieth day, and the *third* on the sixtieth day. In the first, the button had been voided twelve hours after the operation. The serous coat was adherent, much thickened by infiltration, and regeneration had begun. In the other coats there was approximation, but no attempt at regeneration. In the second, there was a very thin line of union in the serous coat, the mucous coat was partially restored, the longitudinal muscular layers almost regenerated, and the submucous coat united by connective tissue. In the third specimen union was complete. There was no thickening at all of the serous coat. The muscular layers were regenerated, and so was the mucous coat. The submucous coat and muscularis mucosa alone showed cicatricial thickening, due to deposit of fibrous tissue. There was no diminution of the lumen of the tube. With this report Dr. Murphy contrasts the result after approximation with the Czerny-Lembert section. In the latter, he found union of the muscular coat very irregular, and little sign of regeneration of fibre even after 106 days. The serosa was much thickened, while the mucous membrane showed no evidence of previous separation. The lumen is much smaller, owing partly to invagination of the approximated ends, partly to cicatricial contraction. In summing up this part of his subject, Dr. Murphy claims, as the reasons of the good results following approximation by his method:—(1) The juxtaposition of coats—*i. e.*, apposition of homogeneous histological elements with re-establishment of their continuity; (2) the very small amount of connective tissue intervening between the ends of tissue that regenerate slowly, if at all.

In the discussion which followed Dr. Murphy's paper, the dangers of subsequent obstruction by the button and of contraction of the lumen were insisted on by various speakers. And while the majority of speakers declared their preference for suture to mechanical means in intestinal cases, one speaker said that his most satisfactory results had been obtained with Abbé's catgut rings.

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ABSTRACTS FROM CURRENT MEDICAL LITERATURE.

NERVOUS DISEASES AND INSANITY.

By Dr. R. S. STEWART.

Diffuse Meningo-Myelitis in Tabes, General Paralysis and Spinal Syphilis. By Nageotte (*Archives de Neurologie*, October, 1895).—From the detailed investigation, clinical and pathological, of four cases the following conclusions are arrived at :—

1. There exists in tabes, general paralysis, and syphilitic myelitis a process of diffuse inflammation which extends throughout the whole length of the cord. This lesion merits the name of vascular or connective by reason of the tissue which is primarily affected ; it consists essentially of an infiltration of round cells which invade the pia-mater, the arachnoid and the capillaries of the cord, and which has a quite peculiar predilection for the tunics of the superficial veins. It brings about consecutive alterations of the higher elements. It appears constantly if, in searching for it, elective-nuclear colourants are employed.
2. The lesions of the cerebral cortex (the cause of general paralysis), those of the radicular nerves (the cause of tabes), the localised plaques of syphilitic myelitis are only the exaggeration of this diffuse lesion at points determined in consequence of a selection which is itself the outcome of anatomico-physiological disposition as yet not recognised.
3. The process is a particular and distinctive one, and, judging from clinical experience, it is certain that in the large majority of cases it is of syphilitic origin.

Thyroid Feeding. By Bruce (*Journal of Mental Science*, October, 1895).—From a study of a further series of sixty cases, it is concluded that the action of thyroid is complex. It undoubtedly produces a mild feverish condition, the action and reaction of which is often of considerable benefit. It is a direct cerebral stimulant. There is a strong probability that at some periods of life the administration of thyroid supplies some substance necessary to the bodily economy.

Severe Maniacal Excitement following the Administration of Salicylate of Soda. By Robertson (*Journal of Mental Science*, October, 1895).—A quiet inoffensive woman who had been an inmate of the Northumberland Asylum for eighteen months, the subject of delusional insanity, began to suffer from subacute rheumatism. Salicylate of soda in 20 grain does every four hours was prescribed, but after the administration of six doses she became restless and talkative, and this shortly passed into acute delirious excitement with violent inco-ordinate muscular activity, which subsided in thirty-six hours. The synovitis, which had disappeared, afterwards returned, but subsided under treatment by alkalies without the occurrence of cerebral complications. In this case the artificial salt was used, which would lend support to the view expressed by Charteris and MacLennan, that the toxic properties are to be attributed to the impurities of the phenol employed in the synthetic preparation of the artificial acid.

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Lesions produced by the Action of Ethyl Alcohol on the Cortical Nerve Cell. By Berkley (*American Journal of Insanity*, July, 1895).—This paper is based on the investigation of the brains of five rabbits which died, nearly all in convulsions, after being fed for periods varying from six months to over a year upon diluted alcohol. Very slight abnormal alterations were found in the vascular walls, principally a rather indefinite multiplication of the nuclei of the intermediary vessels, slight thickening of the walls, a few grains of hæmatoidin crystals in the surrounding lymph space, with an occasional hæmorrhage, and a more definite dilatation of the lymph space surrounding the blood-channels. The most pronounced alterations were found in the nucleolus, which appeared considerably enlarged, roughened, and spongy, with elongated projections from the surface. A large number of the pyramidal cells had on their protoplasmic extensions tumefactions of varying size, commencing apparently near the free extremity of the dendron, and accompanied by a disappearance of the lateral buds of the dendritic processes. The axis-cylinders were found to be perfectly normal. The same alterations, but much more pronounced, were found in the Purkinje cells of the cerebellar cortex. The neuroglial structures were apparently unaffected. From the comparative unimportance of the arterial changes, the writer considers that the destructive lesions observed are to be attributed, not to nutritive changes induced by defective supply of nourishment, but to the direct irritant action of the poison on the protoplasm.

The Treatment of Epilepsy by Flechsig's Method. By Davenport (*American Journal of Insanity*, October, 1895).—After a careful and thorough trial of this method (opium given in half-grain doses, and increased by half-grain per day until 15 grains have been reached, and thereafter replaced by 30 grain doses of bromides four times a day), this writer concludes that it does not result in recovery. It is of benefit in that it gives to many a respite from the attacks. It is soothing and quieting to the irritable patients, and exhilarating to those suffering from depression. Through the cessation of the seizures and other annoying symptoms the patient is enabled to enjoy something of life in general, and to recuperate physically, and for these reasons it is considered desirable to repeat it at intervals of two or three months.

Thyroid Feeding in Mental Trouble. By Clarke (*American Journal of Insanity*, October, 1895).—A detailed account is given of five cases subjected to this treatment, from which the writer concludes that cell-nutrition is undoubtedly affected in a striking manner, that increased metabolism occurs as the result of the quickened circulation, and that the auto-toxic process that exists in some, if not all, cases of mental disease is interfered with in a way that may be beneficial. If, however, the vitality is low, and the patient has not the ability to recover from the fever induced by the thyroid feeding, decided harm will result from the treatment, and a rapid decline in strength probably take place.

Criminal Anthropology applied to Pedagogy. By Lombroso (*The Monist*, October, 1895).—Professor Lombroso, in a lecture delivered before the teachers of Turin, expresses his conviction that the systematic study of the characteristics of school children, physical and mental, would bring about a genuine revolution in the prophylaxis of crime. He points out that the inclinations of the child are almost the same as of the adult rascal, but usually disappear as age advances. In some instances, however, these characteristics are conspicuous, and continue to be more and more prominent, and in these cases there are associated physical peculiarities; and it is in the detection and pointing out of these possible criminals of the future that, Lombroso thinks, the teacher can do so much truly useful work.

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SURGERY.

By HENRY RUTHERFURD, M.B.

Operations on the Stomach.—Mikulicz reports 103 cases operated on in his clinic over a period of thirteen years, with a total mortality of 24. These were done at Cracow, at Königsberg, and at Breslau, and they include 22 cases operated on by his assistants. The classified list is made up of—

44 gastrostomies,	with 6 deaths.	
20 resections of the pylorus,	,, 5	,,
26 gastro-enterostomies,	,, 7	,,
6 pyloroplasties,	,, 3	,,
6 gastrectomies and gastrotomies,	,, 3	,,
1 operation for compression of the pylorus by a gall-stone, which was successful.		

The operative technique has been practically that formulated by Billroth, so far, at least, as concerns the three most important operations—resection of the pylorus, gastro-enterostomy, and pyloroplasty. In the case of gastrostomy the method of Witzel was almost exclusively used of late years.

The classification according to primary lesion is also of interest as showing the bearing of this on the result:—

1. Non-cancerous conditions without severe complications (stricture of œsophagus, ulcer of the stomach, stenosis of pylorus, obstruction by gall-stone) —24 cases, of which 2 died = 8⅓ per cent.

2. Cancer of pylorus or œsophagus—73 cases, of which 17 died = 23⅓ per cent.

3. Severe complications (bleeding from stomach or duodenum, perforation) —6 cases, of which 5 died = 83 per cent.

A third list shows the mode of death in the fatal cases. There died of—

Collapse, on the first to the third day,	8
Pneumonia, on the fourth to the eleventh day,	4
Peritonitis, ninth to fourteenth day (1 gastrostomy, 1 pylorectomy),	2
Phlegmon of abdominal wall (gastrostomy),	1
Inanition (with delirium), on fourth and eleventh days,	2
Spur formation after gastro-enterostomy, third and fifth days,	2
Gangrene of transverse colon after excision of pylorus, on the fourth day,	1
Bleeding from the carcinoma of pylorus (gastro-enterostomy) on the fifth day,	1
Bleeding from aneurysm of hepatic artery (gastro-enterostomy),	1
Compression of new-formed pylorus by adhesions (pylorectomy), sixteenth day,	1
Uncontrollable vomiting, unexplained by autopsy (gastro-enterostomy), fifth day,	1
Total,	24

After-results in the Carcinomatous Cases.

A. Gastrostomy for carcinoma of the œsophagus.—Of 28 cases which survived the operation more than three weeks, 20 have died. The longest survival was for twelve months; the average was four and a half to five months.

B. Gastro-enterostomy for carcinoma of pylorus.—Of 16 patients, 8 have died. The longest survival was twenty-seven months; the average, nine and a half months.

C. Excision of pylorus for carcinoma.—Of 13 who survived operation, 9

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have died since. The longest survival was thirty-six months; the average, sixteen and a quarter months. Under this heading, Mikulicz notes that Billroth had a patient who survived the operation five years, and that Kocher reports one free of recurrence nearly seven years after operation.

The earlier gastro-enterostomies were done according to Wölfler's procedure (jejunum brought up over transverse colon); latterly, Hacker's operation has been practised, except where the posterior wall of the stomach was too much diseased. With reference to the so-called spur formation or kinking of the afferent coil of bowel, doubt is expressed as to whether the symptoms are due to this, and it is suggested that more probably they are due to atony of the stomach, which is unable to expel its contents through the fistula. To this cause he refers the otherwise unexplained result in the last mentioned fatal case.

He strongly recommends the administration of intravenous, salt solution injections as a preparation for operation in much reduced patients, to be repeated afterwards if necessary. For the most part, no dependence is placed on rectal feeding. From the second day onward the patients receive by the mouth milk and soup with egg in small quantities every quarter or half-hour. —*Arch. für Klin. Chir.*, Bd. 51, Hft. 1.

Mr. Hutchinson on Syphilitic Eruptions.—It is a great mistake to suppose that the eruptions which occur in secondary syphilis can always be recognised by their own special characters.

That the outbreak is general and symmetrically arranged, that it does not exactly resemble any one of the recognised non-specific eruptions, but mixes the characters of several, are perhaps some of the best general indications for diagnosis. Amongst the more special ones may be mentioned the following:—

1. Syphilitic eruptions are seldom attended by congestion of a bright tint, but are usually more or less dusky.

2. In addition to the dusky hue, due to congestion of venous capillaries, there is often a colour which is recognised by the terms "coppery" or "lean of ham" tint.

3. Syphilitic eruptions show a preference for certain positions—the abdomen and front of chest, the bend of the elbow and front of fore-arm, and the face.

4. Syphilitic eruptions are often polymorphous—*i.e.*, scaly, papular, lichenoid, and pustular, all at the same time.—(*Archives of Surgery*, July, 1895.)

Tumour of Brain—Condition Three Years after Removal.—Bramann (of Halle) was able to present to the Surgical Congress in Berlin, in April of this year, a patient on whom he had operated three years before, and whose case he had reported to the Congress of that date. The tumour weighed 280 grammes (nearly 10 ounces), and the opening in the skull measured 13 cm. by 11 cm. ($5\frac{1}{16}$ inches by $4\frac{1}{8}$ inches). Patient was, at the time of operation, 29 years of age. The tumour was on the surface of the right hemisphere, and would seem to have involved dura and inner surface of skull, making it impossible to close the bony defect. Symptoms had come on suddenly about a year before, and consisted in headache and giddiness; double-sided optic neuritis more pronounced in the right side; paralysis of the left facial nerve; paresis of the left arm well marked, and to a less degree of left leg; frequent attacks of twitchings and convulsive movements in the paretic regions.

For about three months the patient would seem to have been entirely free. Then came convulsive seizures much as before, with loss of consciousness, passing off and leaving a feeling of dulness and aggravation of the paretic condition. It seemed that these attacks could be explained by accidental compression of the unprotected surface of the brain during sleep; for, if the patient was prevented from resting on that side of his head, the attacks did not occur; and after he was fitted with an aluminum shield, he had a period of five months of complete immunity. Movements of both eyes free; the left shoulder droops somewhat; left elbow, wrist, and fingers the seat of a

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progressive contracture; a slight enfeeblement of facial muscles on the left side; bilateral optic atrophy more pronounced in the right fundus. The reaction of the right pupil to light is also very sluggish.

The patient is quite sensible, feels well, apart from occasional seizures, is free from headache and giddiness, and is able to manage his business and superintend his workmen.—(*Archiv. für Klin. Chir.*, Bd. 51, Hft. 1.)

Fracture of the Patella.—In a discussion at the College of Physicians of Philadelphia, Ashurst insisted on the necessity of discriminating in the different kinds of fracture. The patella was a sesamoid bone, and if it be broken with integrity of the capsular expansion of the tendons all round, the patient still has the power to extend the leg as well as before. After excision of the patella, as in gunshot wounds, which is really the best treatment, the functions of the quadriceps and movements of the limb are not interfered with. He went even further; there were cases with 5 to 6 inches of separation where the patient is able to walk about and attend to the ordinary duties of life; . . . this was because the fibres of the quadriceps were not broken. He questioned, on the other hand, the occurrence of bony union even after operative procedure. Disability after this injury was often due in the main to ankylosis.

Dr. J. W. White showed three cases in which he had operated by Barker's method (subcutaneous silk suture). He had seen no results from what was known as the old method which would compare with the results obtained by operation. He did not attach much importance to the question of bony union. It was of importance to curtail the long period of treatment and disability required by the old methods.

Dr. Ashhurst spoke of wearing apparatus for nine months. Of the three cases shown by him, two were back at work within two months, the other in eleven weeks from time of injury.—(*Annals of Surgery*, November, 1895.)

GYNÆCOLOGY AND OBSTETRICS.

By E. H. LAWRENCE OLIPHANT, M.D.

Tumours Complicating Pregnancy and Labour.—In discussing the complication of pregnancy and labour with ovarian tumours, Rubeska (*Mon. f. Geb. u. Gyn.*, September, 1895) strongly supports the principle that all ovarian tumours met with in pregnancy should be operated on. Among others, he gives a remarkable example of a cancerous ovarian tumour which was removed one month before the term of pregnancy. The child was born at full time, and was nursed for some weeks; but the mother died from recurrence two months and seven days after the birth of the child.

When the tumour is first met with during labour Rubeska has found that, when it is raised out of the pelvis and labour allowed to go on, the pressure upon the tumour during labour may cause such extensive adhesions as to render extirpation at a later period impossible. He suggests, therefore, that such tumours should be removed after the first week of the puerperium is past—that is, after it is certain that no infection has occurred during labour.

Tumours which cannot be raised out of the pelvis during labour are emptied either by puncture or by incision per vaginam. In the case of solid tumours he suggests that, instead of Cæsarean section at the time of removal of the tumour, this might be extirpated and labour terminated by manual or instrumental extraction of the child per vaginam.

When a cyst has been emptied to permit of the delivery of the child, and has become purulent in the puerperium, he advocates removal per vaginam, or, if necessary, by a combined abdominal and vaginal operation.

Staude (*Mon. f. Geb. u. Gyn.*, October, 1895) reports two cases of ovarian tumour occurring during pregnancy—one of them a dermoid. As they

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occupied the pelvis below the pregnant uterus, and would have offered an obstacle to the passage of the child, they were removed by coeliotomy, and the pregnancy went on without interruption.

He also reports two cases which were only discovered after labour had commenced, and which presented an insuperable obstacle to delivery. In one of them—a left intraligamentary tumour of the size of a child's head, and a right-sided orange-sized cyst—a Cæsarean section was performed, followed by the removal of the ovarian tumours, and afterwards by amputation of the uterus itself for atony. In the other case the cyst was removed per vaginam.

Macks (Aug. Martin's *Festschrift*, 1895) collects the cases of ovarian tumours and myomas complicating pregnancy met with in Martin's Institution in 1890-1894.

There were *thirteen* cases of myomas. In *four*, in which the tumours were small and situated at or near the fundus, pregnancy and labour went on undisturbed. In *four*—interstitial tumours—abortion resulted at the third or fifth month. *One* was operated upon in the first month of pregnancy, which was not then recognised, and several small tumours removed, the pregnancy going on without interruption to term. In *two* cases—one at the *fifth* and the other at the *seventh* month—total extirpation of uterus and tumours was done, death following in one of them from septic peritonitis. *Two* were met with during labour. In one the tumour was enucleated per vaginam, and labour went on satisfactorily. In the other the aftercoming head was perforated, and the woman had a tedious feverish puerperium.

There were seven cases of ovarian tumour.

Two of these seemed to cease growing during the pregnancy—a fact insisted on especially by Löhlein—but to take on rapid growth in the puerperium.

In *five* cases coeliotomy and removal of the cyst. In three the pregnancy went on to term.

Macks quotes Heiberg's and Dsirne's statistics, which show that when pregnancy is complicated with ovarian tumour, about 25 per cent of the mothers and 75 per cent of the ova perish; while, in cases operated on, the maternal mortality is 5·9 per cent, and abortions occur in 25·5 per cent.—J. K. K.

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The Cavendish Lecture on Dreamy Mental States, by Sir James Crichton-Brown, M.D., F.R.S. London: Baillière, Tindall & Cox. 1895. (1s.)

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